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ABSTRACT

THE ARCHITECTURE OF TELL JALUL

by

Carina de Oliveira Prestes

Adviser: Randall W. Younker

ABSTRACT OF GRADUATE STUDENT RESEARCH

Thesis

Andrews University

Seventh-day Adventist Theological Seminary

Title: THE ARCHITECTURE OF TELL JALUL

Name of researcher: Carina de Oliveira Prestes

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The Problem

Buildings excavated in Tell Jalul have been studied separately for the last twenty years. However, until the present moment, no comprehensive study has been conducted. Therefore, this thesis will discuss the architecture of the main edifications found in Tell Jalul from 1992 to 2012.

The Method

For this project, the ruins found in fields A, B, C, D, G and W were considered. First, a literature review was done to find similar structures in Jordan and the neighboring areas and their basic features. Then, a three-dimensional reconstruction of the ruins was

suggested. The reconstruction was made in AutoCad 2013, software widely used for engineering, based on the two-dimensional drawings previously prepared.

The Results

Parallels to the majority of the constructions were found, making it possible to compare them and suggest a reconstruction and possible implications. In addition, a three-dimensional model was made of each individual building and also of the entire tell with the studied constructions.

Conclusions

It was possible to conclude that Jalul was a significant site in different periods of history. The size and complexity of the constructions point to a centralized power. However, the tell does not have large enough structures to be a royal city, nor is it small enough to fit in the village description.

Andrews University
Seventh-day Adventist Theological Seminary

THE ARCHITECTURE OF TELL JALUL

A Thesis
Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Carina de Oliveira Prestes

2014

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A thesis
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Carina de Oliveira Prestes

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INTRODUCTION

Tell Jalul is located 5 km east of modern Madaba in Jordan. It is the largest tell in the Madaba Plains, with an area of 18 acres. It was suggested that the ancient identity of Jalul could be Heshbon, mentioned in Num 21, or Bezer, mentioned in Josh 20:8, one of the cities of refuge. Thus, it was expected that excavations in Jalul would reveal great insights into history.

Since 1982, Andrews University had tried to dig in Jalul. However, not until 1992 was a permit issued allowing excavations to begin. Since 1992, teams of archaeologists, students, laypersons, and Jordanians have been spending their summers unearthing ancient ruins and objects in Tell Jalul (Younker, Herr, Geraty, and LaBianca 1993).

Nevertheless, the acropolis, the most promising location to be unearthed, was recently used as a cemetery for the local community. Therefore, due to the Jordanians' beliefs and traditions, it has not been possible to excavate there for the last 20 years and it will probably not be possible in the foreseeable future.

The 2012 season was the last one with available reports when this thesis was written. Hence, the present study covers material unearthed up to that season.

Many articles have been written about Jalul, but its architecture has never been studied by itself altogether. There are some articles focusing on individual buildings, but

the architecture has never been approached in a way that considers the whole tell and compares it with others.

The study of ancient architecture can help in the identification and dating of sites, as it did in the cases of Hazor, Gezer, and Megiddo with their six-chambered gates. Architecture can also help in the location of specific structures, such as the tomb of King Herod the Great at Herodium.

Hence, the present study analyzes six structures unearthed in the last 20 years in Jalul's lower city: a tripartite pillared building, the approach road, the city gate, a four-room house, and the water works. These structures are spread throughout five different fields: A, B, C, D, G and W.

First, a review of literature will be made, focusing on each individual structure in order to list their characteristics and patterns. Following this, the ruins of the structures found in Jalul and structures in Palestine and Jordan are compared using the characteristics studied in the previous section, and similarities and differences are highlighted. Then, a brief history of the excavations of each field is presented with a description of the structure that is being discussed. Lastly, pictures of a three-dimensional model are explored. A schematic perspective of the ruins dug at the time of excavation has been created for each structure, as well as a suggested reconstruction of the buildings based on the previous research. In addition, their locations on the tell are identified.

The drawings were made using AutoCAD 2013. This software has been used for many years in engineering and architecture. It takes as much work as traditional drawing, but once the three-dimensional model is ready, it is possible to generate infinite views,

sections, perspectives, and videos. It is also easier to make alterations to AutoCAD drawings than to traditional hard copy drawings.

This thesis is a descriptive project. Therefore, it does not bring any new data. Nevertheless, it does shed more light on Jalul as a city through the investigation of the buildings and their relationships with each other, and through the comparison with similar structures. Discovering the ancient identity of Jalul is not the aim of this thesis, but it aspires to provide some guidelines that may help in the categorization of the city through architectural analysis.

CHAPTER 1

FIELDS A AND B

Field A: Pillared Tripartite Building

General Description of Pillared Tripartite Building

The pillared building is one of the prominent structures used for administrative purposes during the Iron Age within the urban system in Israel (Herzog 1992a: 223). It consists of a rectangle divided longitudinally by pillars into three narrow halls (Gregor 2009). The central room's floor is generally made of beaten earth or lime (Herr 1988), and the side rooms are paved with flagstones (figs. 3 and 4).

There is no consistency in size or proportion of the buildings. However, all of them are rectangular. Another characteristic often seen in tripartite buildings is the presence of shallow bins and platforms between the pillars. In addition, the entrance is usually on the short side (figs. 5 and 6). Furthermore, complexes of various pillared buildings consisting of up to 12 units have been uncovered at some sites (Herr 1988), while at other sites only a single structure was found.

Considering the building's location within the city, various public buildings have been unearthed near the city gates or the city walls at various sites. The location of these

buildings is no coincidence; presumably they constituted part of the gate complex (Faust 2012: 101).

The purpose of the tripartite building is not yet clear. The majority of the small finds in these buildings have been vessels of daily use. Nevertheless, according to Yadin (1976) and Holladay (1986), the finds at the time of excavation point to the last use of a structure, not necessarily to its planned use. Furthermore, Herr (1988) also points out that in order to define the use of the structure, its location within the city and the number of units built together should be considered. Here are the most accepted suggestions regarding the usage of these buildings: stables, storehouses, barracks or soldiers' residences, trade centers, markets, and customhouses. The most accepted purposes by scholars are stables and storehouses or a combination of the two. There are cases where the two side aisles were built with different purposes, as in Tel Hadar (Faust 2012: 102), where one wing was used for storage while another wing contained evidence of food preparation (Kochavi 1992).

Comparison with Similar Structures

In this section, several aspects of the pillared buildings will be analyzed: flooring, number of units/complex built together, construction between pillars, and location within the city. In each one of them, Jalul's pillared building will be described first, then sites with similar features will be named, and then singular features of Jalul will be highlighted.

The Jalul building had its outer aisles paved with flagstones and its central aisle covered with beaten earth (fig. 2). Sites where the floors found were similar to that at Jalul are Hazor (Yadin et al. 1989: 183), Megiddo (Lamon and Shipton 1939), Beer

Sheba (Herzog 1973: 23-30), Malhata (Kochavi 1970: 22-4), and Hirbet el-Mudeyine (Daviau 2006).

As for the number of units, Jalul has revealed one unit thus far. There may be others in other fields not excavated yet, but in Field A there is only one unit, and the surrounding edifices are not pillared buildings; they are smaller and do not fit the typical characteristics. The following sites also presented only one unit: Abu Hawam (Hamilton 1932: 8-10), Beth Shemesh, Hazor (Yadin et al. 1989: 183), and Malhata (Kochavi 1970: 22-24).

Looking at the construction between pillars, Jalul's pillared building has had most of its stones robbed out; therefore, it is difficult to affirm that there was any kind of construction between pillars. Furthermore, no mangers or basins were found inside or around the building. Nevertheless, there is a stylobate below the east row of pillars (fig. 7). The following sites had some kind of inter-pillar construction present: Hazor (Yadin et al. 1989: 183), Megiddo (Lamon and Shipton 1937: 37), Beer Sheba (Herzog 1973: 23-30), and Hirbet el-Mudeyine (Daviau 2006).

Jalul's pillared building is approximately 75 m from the gatehouse (fig. 49). At other sites that had a long distance between the gatehouse and the tripartite building, they were 60 m apart; 75 m is larger than expected. The sites that had a similar distance to Jalul between the two structures are Lachish and Megiddo; at most of the other sites, the tripartite building was closer to the gatehouse. However, at Jalul the pillared building was probably close to the city wall. Even though the city wall has not been found in this area of the tell, the great decline in the terrain points to proximity to the wall (fig. 1). In addition, the gatehouse and the tripartite building are on the east side of the town.

The second distinctive point from Jalul is the presence of a stylobate under just one row of pillars (fig. 8). It was suggested by Gregor (2009) that the stylobate was built to compensate for the softness and inclination of the soil.

History of Excavations

Excavations in Field A started with the activities in Tell Jalul in 1992 (fig. 2). There was a need to establish a chronological framework for the site; therefore, this area was chosen because it was clear that numerous occupational remains had accumulated there. The inclination was great enough that an excavation trench would expose a vertical section through the occupational levels. During the first season, only one wall was unearthed, and at that time it was unclear if it was a city wall or part of a building. It was dated to the eighth century B.C. (Younker et al. 1993).

During the following season, 1994, new squares were dug to the south of the previous ones, revealing new walls and two rows of parallel pillars. After the walls, pillars, and floors were unearthed (fig. 4), it became evident that the building excavated was the architectural form known as a tripartite pillared building (Gregor 2009). During that season, it was found that the side rooms were paved with flagstones and the central aisle was covered with beaten earth. The side aisles had had most of their paving stones robbed and the central aisle was greatly damaged by the digging of 19th-century A.D. graves, but it was possible to see its original pavement in the north section of the building. When the 1994 season was over, another wall from the seventh century B.C. was found inside the eighth-century B.C. wall excavated in the previous season. The complete extent of the building had not been fully revealed yet.

In 1996, work in Field A was concentrated on fully exposing the tripartite pillared building (Gregor and Gregor 1997). New squares were opened: four to the south and two and a half to the east. By the end of the 1996 season the entire building was dug, and no doubt remained that this structure was a tripartite pillared building. Even though they were damaged by later activities, parts of all four walls were traced. The west wall had survived in its entire length and was visible above the floor level of the structure. Most of the pillars found had either fallen toward the north or were tilted. The floor of the edifice was just 1 m below the ground surface, showing that its stones were probably visible for many years and attracted stone robbers.

The dimensions of the building were 17 m long x 10.2 m wide (Gregor 2009). Most of the walls that survived were 10 or 20 cm high and 1 m thick. One pillar stood 1 m high (Gregor 2009). The pillars were lined up 2 m apart from each other in two rows. The central aisle, between the two rows of pillars, was 2.5 m wide. The west row of pillars was laid right on the existing surface, whereas the east row of pillars was laid on a stylobate (fig. 3) 1 m wide x 0.6 m high (Gregor 2009). The lower courses of stones in the walls were larger stones, showing good building methods. Some of the stones used in the building were recycled, such as a large door socket and a large stone basin.

The building is located at the northeast side of the tell, probably close to the city wall and 75 m north of the gate (fig. 1). In an attempt to date the building and examine the foundation, the sealed floor was penetrated. According to the pottery analyzed, it was concluded that the building dated to the seventh century B.C. The structure collapsed due to abandonment. Above the ruins of the tripartite building, the fragmentary remains of a quite large Persian building were found. Under the pillared building, fragments of an

earlier building dating to the eighth century B.C. were found. Not much was left from this earlier structure. Most of its stones were reused to build the tripartite pillared building. For some unknown reason, the builders decided not to use the stones or reuse the north wall from the eighth century found in the first season; instead, they built a new wall right next to it (Gregor 2009).

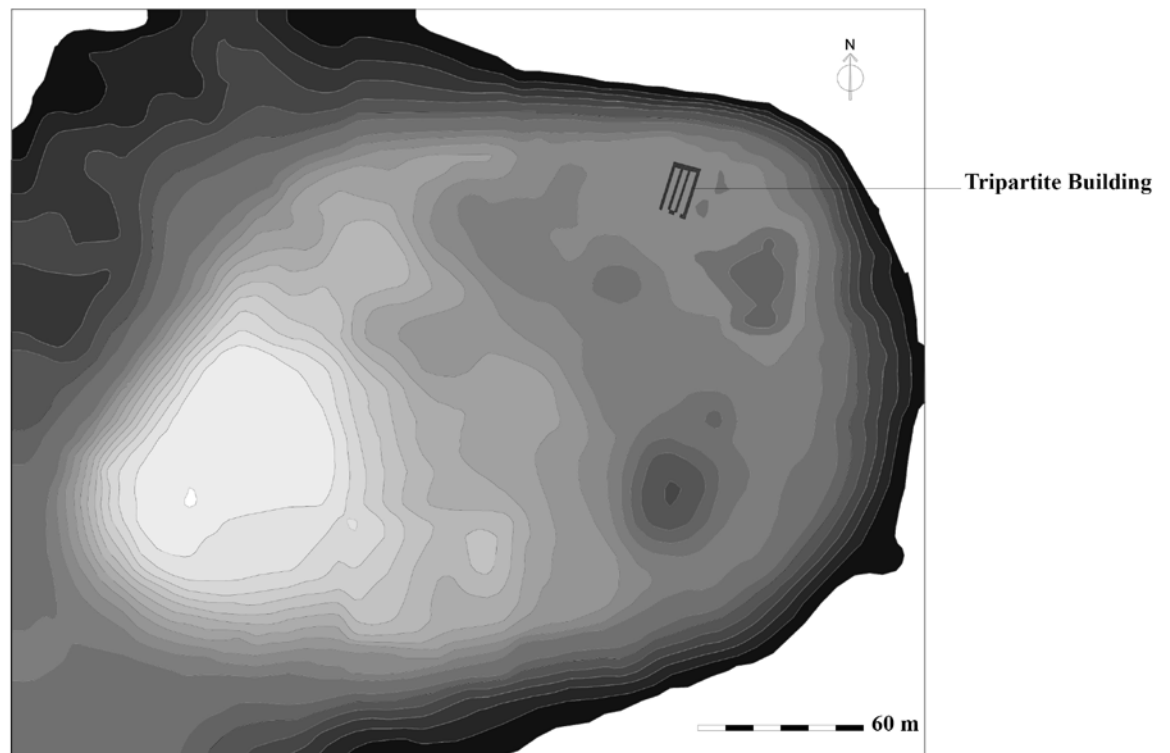


Figure 1. Field A tripartite building topographic map.

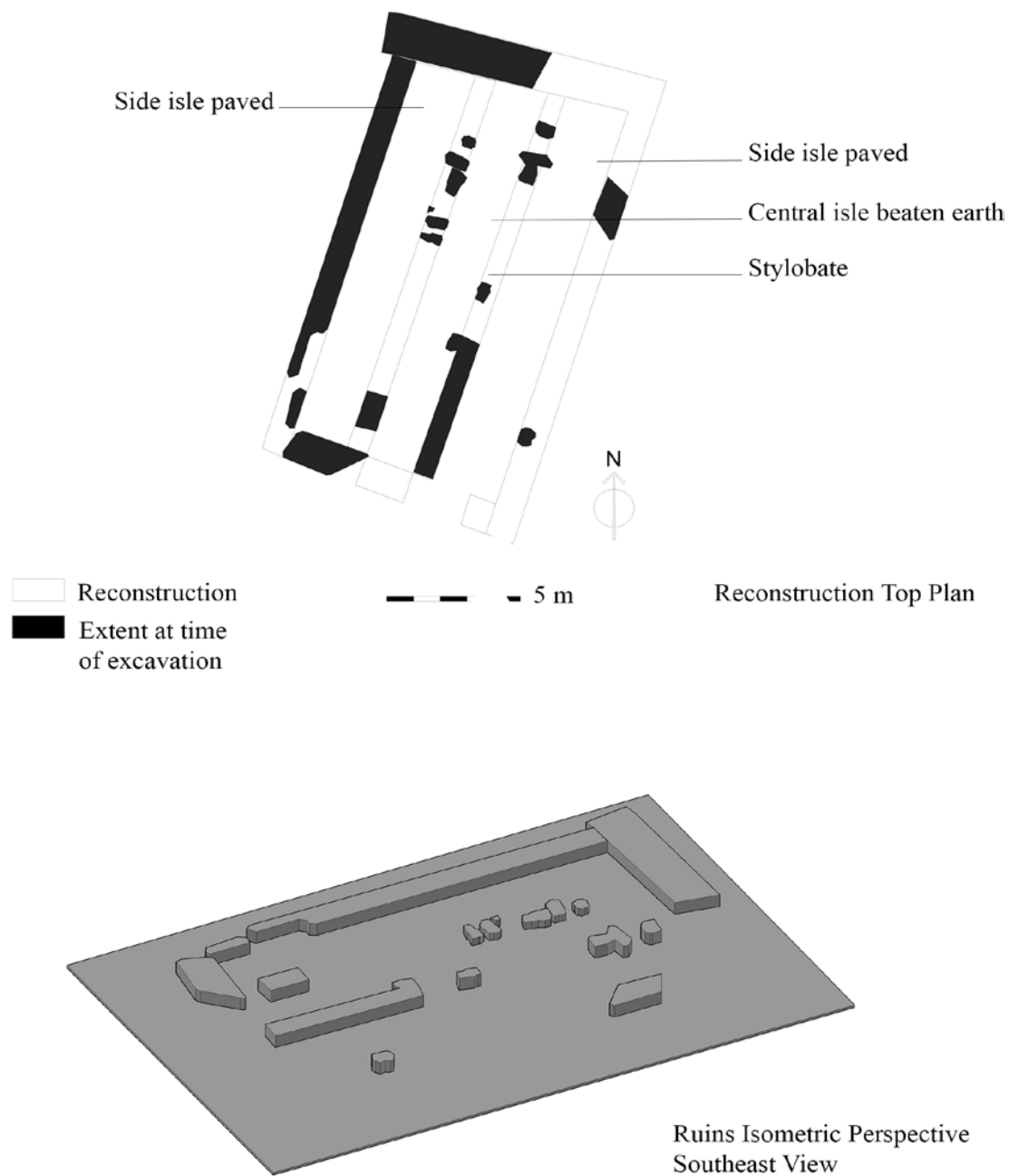


Figure 2. Field A tripartite building reconstruction top plan and ruins isometric perspective.

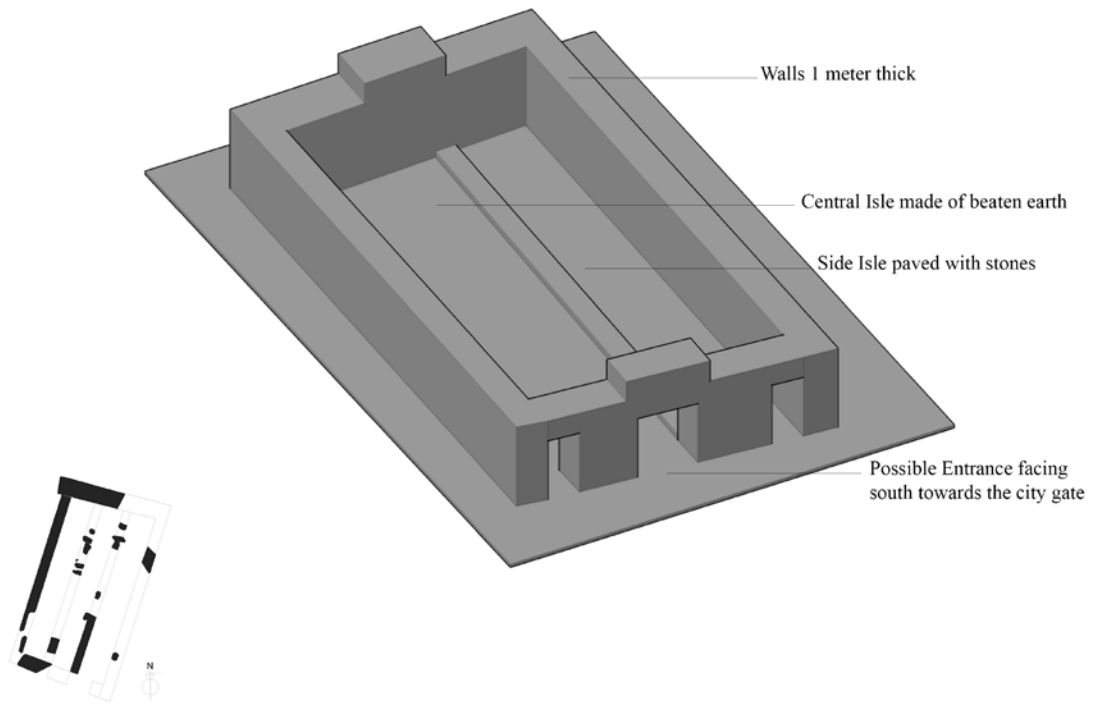


Figure 3. Field A tripartite building SW isometric perspective.

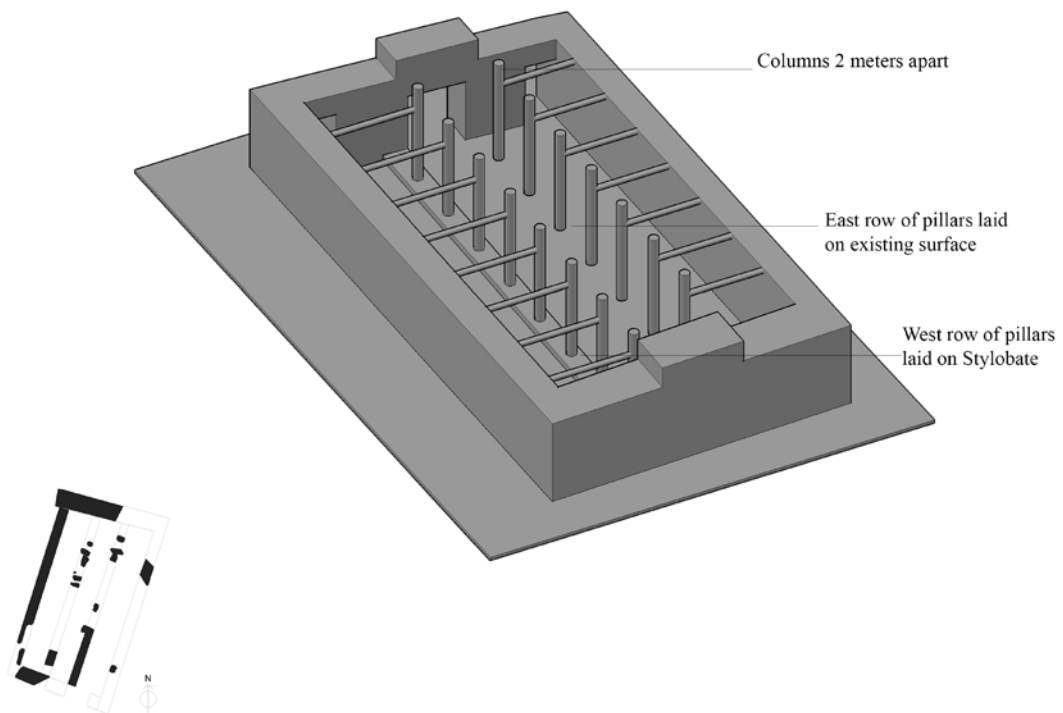


Figure 4. Field A tripartite building NE isometric perspective.

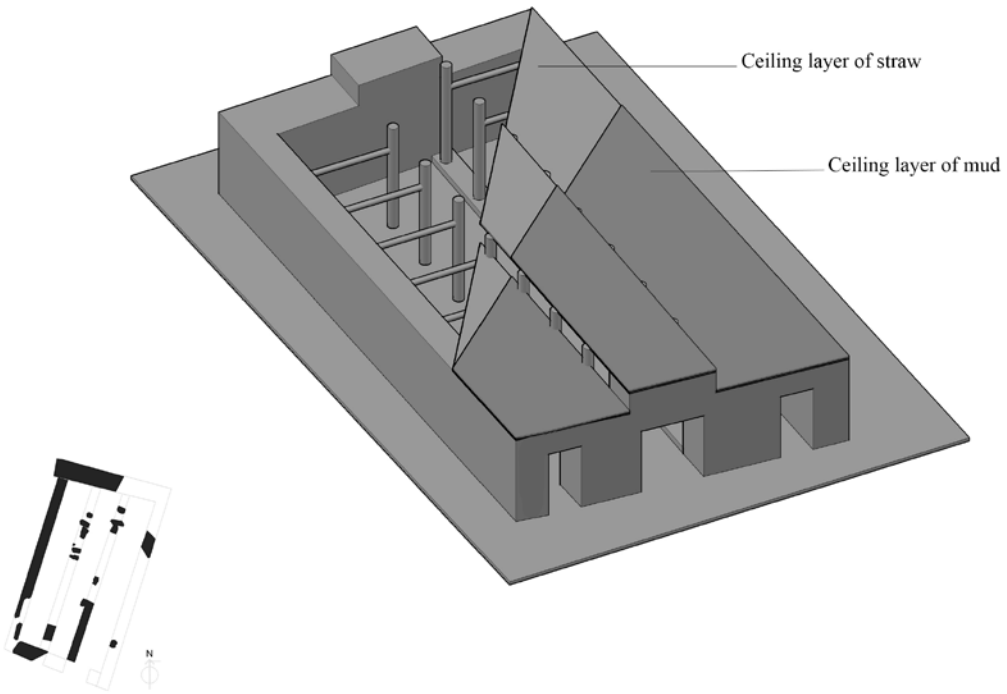
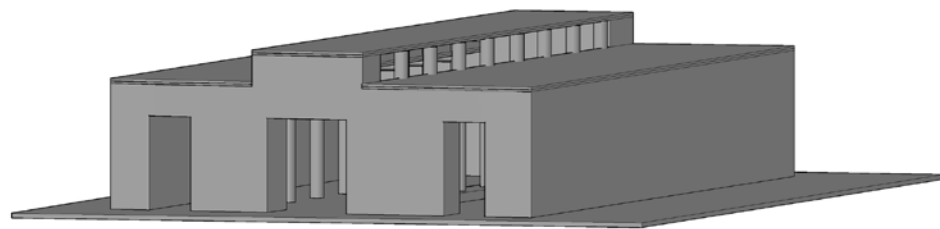
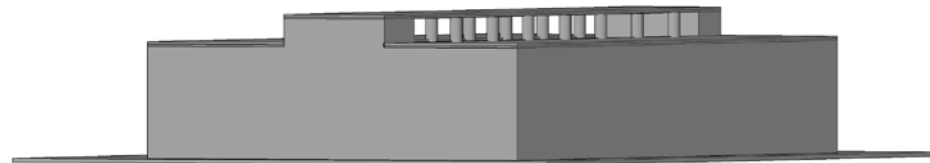


Figure 5. Field A tripartite building SW isometric perspective—ceiling.



Front Perspective



Back Perspective

Figure 6. Field A tripartite building—perspectives.

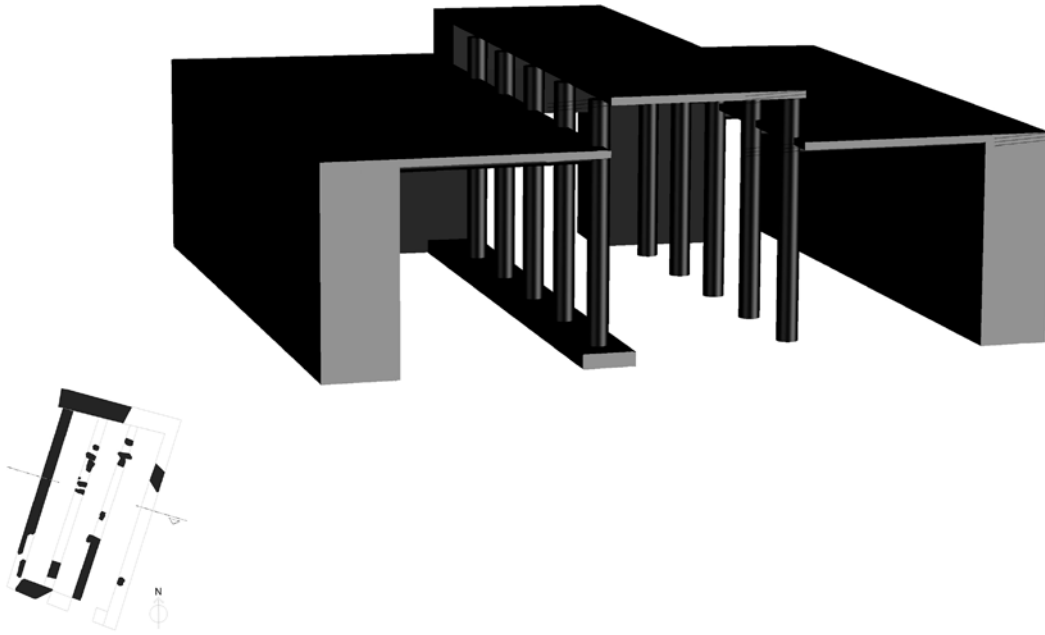


Figure 7. Field A tripartite building section east-west.

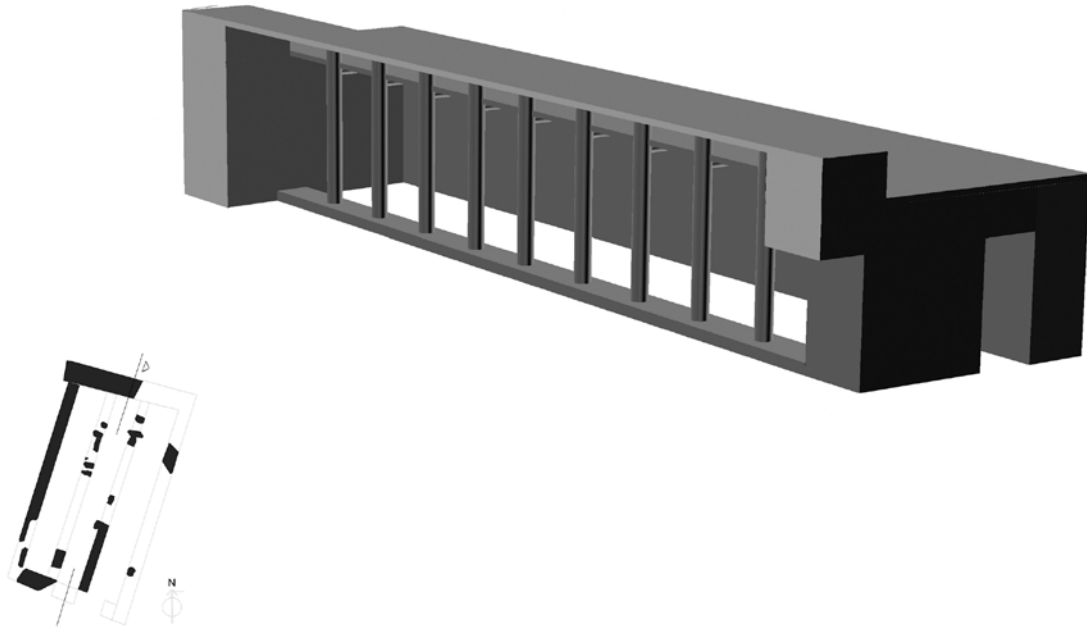


Figure 8. Field A tripartite building section north-south.

Field B: City Gatehouse and Approach Road

General Description of Gatehouse

Fortifications are the most important architectural feature in urban settlements from the Iron Age II (Barkay 1992). Usually they vary in size, construction techniques, and structures. However, there are some characteristic elements that are usually present: location on an elevated surface, water supply, a wall surrounding the perimeter, watchtowers at crucial points on the wall, an approach road laid to expose the enemy's weak point, and a gate complex. All of them were combined in a certain way to enhance the defense capability of the city.

The gate complex included more than just a gate. It included other constructions around it, and frequently two separate gates were built with a road between them. The entry through the outer to the inner gate was gained by a dogleg right turn (fig. 14); in this way, the approaching enemy carrying shields on the left would be exposed to attacks from the people defending the city. After the first gate and this turn, the attacking enemy would find the inner gate (figs. 15 and 16) that added security to the gate complex (King and Stager 2001: 234).

The Solomonic six-chambered gates found in Hazor, Gezer, and Megiddo are great examples of Iron Age fortifications. They are all similar in size and building techniques. Furthermore, they are all made up of six chambers, three on each side. The six-chambered gates became widely known because they show a correlation between biblical narrative and history through archaeology (1 Kgs 9:15). The size and number of chambers of the gate reflected the cultural and defensive needs of each settlement. In

some settlements the earliest example of gate is the two-chambered, then the four-chambered gate, and the six-chambered gate (Herzog 1992b: 267).

There are six-chambered gates in Ashdod, Lachish, Hirbet el-Mudeyine, and Tel 'Ira, but they differ in size and construction details. One of the differences is the type of city wall to which the gate is attached. Some are casemate walls, some are massive, and others are offset-and-inset walls. There is a debate about the offset-and-inset walls. It is generally accepted that these walls are contemporaneous to the six-chambered gate, but some scholars (Yadin, Dever, and Stager) argue that the gate preceded the offset-and-inset wall.

The function and format of the city gatehouse changed considerably throughout time. In the Bronze and Iron Ages, the passageway of the gate was flanked by two large towers (Herzog 1992b). During the Bronze Age, the rooms of the towers were closed and unconnected to the passage, and only thin columns projected into it. The purpose of the gate during the Bronze Age was only defensive. However, through the Iron Age II, the rooms of the gatehouse opened onto the passage all along their width (fig. 13). The Iron Age gate size, openness, and finds (benches and stone basins) indicate that the gatehouses had more than a defensive purpose: they were used for daily peaceful civilian needs as well. "The gate was a social institution that the city's residents respected because it represented order, a concept of great importance in human society in general and in the Israelite society of Iron Age II in particular. . . . The biblical term 'the city gate' did not refer only to the gate structure but to a whole area or quarter that included the gate building, the adjacent square or plaza, and the public buildings nearby" (Faust 2012: 101).

The biblical account also suggests multiple uses of the gate (Amos 5:12; Job 5:4; Deut 15:7; Prov 22:22; Exod 20:10). The size of the gate complex varied according to the purpose and size of the city. Some cities served as storehouses; thus, they would have more buildings set aside as silos. These silos were part of the gate complex close to the city entrance. Major administrative cities would have a stronger defense system and more stables. On the other hand, provincial towns did not have public structures (Herzog 1992b).

When examining Iron Age II fortifications, it is necessary to mention the impressive water systems found in cities such as Jerusalem, Hazor, Megiddo, Gezer, Beersheba, and Gibeon. It is clear that much more effort, planning, and engineering were invested to build these structures than what was needed for the city walls (Herzog 1992b). A long siege would be more dangerous than a frontal assault with battering rams. Sites that clearly show this are Gezer and Beersheba. They had impressive water systems, but were protected by a casemate wall, which is not the best structure to face a front assault. Therefore, it can be affirmed that water systems were also a strategy of war. Water systems will be further discussed in chapter 3.

Comparison with Similar Structures

About 75% of the Iron Age city gates face east (Faust 2012: 107). Jalul's inner gatehouse also faces east (fig. 9). However, due to denudation, not much is left of the gatehouses in Jalul—just a few stones on the ground that point to the existence of an outer and an inner gatehouse. The gates' size and shape are not possible to discern. It looks like the paving stones of the approach road were not as appealing to the robbers as the gatehouse stones; a great number of stones were found in the city approach road

while the gatehouse stones on the same path were missing. Stones from the south portion of the road were also missing due to robbery, but the unrobbed area in the road is larger than the gatehouse (fig. 10).

The approach road was paved with flagstone (fig. 11) in a similar fashion to those found at Tel Dan and Tel Beersheba in Israel (Younker et al. 1993). These two Israelite sites have four-chambered gates and their plans are very similar to each other, which points to their common origin. According to Aharoni (1974), the two sites Dan and Beersheba were built by King David, while Hazor, Gezer, and Megiddo were built by Solomon. The biblical identity of Jalul is still unknown, but the most accepted suggestions are Heshbon, mentioned in Num 21, and Bezer, mentioned in Josh 20:8. Andrew Dearman (1989) has proposed that Jalul was the biblical city of refuge Bezer. Shechem, another city of refuge, also possessed a four-chambered gate, but it is dated to the Middle Bronze Age (Wright 2003-2004).

Part of the city wall has been found only in Field G. The stones from the city wall that were supposed to be parallel to the approach road connecting with the gatehouse in Field B were robbed. The reason for the complete absence of the wall is that its foundation was only a few centimeters below the present surface; therefore, when most of its height was above the ground the wall was probably an easy source of material for new buildings through the centuries.

History of Excavations

Excavations in Field B began in 1992 where surface remains indicated the possibility of a gateway (fig. 12). The first season revealed two approach roads (fig. 10), an earlier and a later one (Younker et al. 1993), with approximately 1 m of debris

separating them. Both roads were bordered on the western side by retaining walls, and the east sides were not excavated during the first season. The total length of the earlier road exposed during the first season was approximately 10 m across two squares. The later road was exposed across the length of three squares, for a distance of around 18 m. Both roads were paved with flagstones in a similar fashion to those at Tel Dan and Beersheba (Younker et al. 1993). They were located on the east side of the tell, with a north-south orientation and the lower part of the ramp to the north.

In the 1994 season, the two ramps were traced through additional squares opened to the south. The earlier road led to the ruins of the outer gatehouse (Younker et al. 1996), which had three piers still in place. However, the rest of the gatehouse was robbed out (Younker et al. 1996). It is possible to see the robber's trench at the east balk where a pier was removed. South of the outer gatehouse, there are four large stones where a threshold might be expected. It is not perfectly in line with the gate and may represent a later phase. The later road was also excavated during this season, and apparently led to a gatehouse, but no remains were left.

Through the 1996 season, the following features were uncovered from the Early Iron Age II: additional flagstones between the outer gatehouse and what looks like the threshold of the inner gatehouse. Furthermore, it was suggested through stratigraphy that during the Early Iron Age II, the gateway's entrance was recovered with flagstones at least four times. In addition, the excavation team revealed evidence that points to the reconstruction of the outer gatehouse, making it larger, slightly to the south. This enlargement took place around a century after the original construction. Four stones of this new phase survived until the time of excavation: two foundation stones and two

paving stones. The portion of road between the threshold of the new outer gatehouse and the inner gatehouse was also resurfaced with crushed *nari*, plaster, or flagstones (Younker et al. 1997).

In the summer of 1999, Field B was excavated for the fourth time, and the earliest phase found during this season was dated to the Early Iron II—ninth century B.C. Two pylons of the inner gate chamber, the curb of the pavement that goes through the gate, and some flagstones of the pavement were found (Younker and Merling 2000). The next phase to be unearthed was the Iron II—eighth century B.C. It yielded a wall and a fill under the pavement. Next was the Iron II—eighth to seventh century B.C. In it, a pavement above the fill from the previous phase in Squares B15 and B14 was found. After that, the Late Iron Age II—seventh to sixth century B.C.—was represented by a pavement in Square B15. Then, in the course of the Late Iron II/Persian periods—sixth to fifth century B.C.—the architectural finds included the repaving of the road through the inner gatehouse, the top course of a wall, and the curb along the side of the entryway road. Finally, the latest phase consisted of debris accumulation with two bins and a pit that contained Hellenistic sherds.

In 2004, an eroded balk was removed to prevent accidents, and in the process more pavement stones from the eighth century B.C. were exposed.

The 2005 season revealed several additional meters of the eighth-century B.C. approach road in Square B20. The road did not continue to the next Squares, B21 and B22, as anticipated. It was concluded that the road was destroyed in antiquity because it disappears in the middle of Square B20 (Younker et al. 2007). Figure 17 illustrates the

east and north views of the gate house and the approach road showing the road's inclination as it approaches the city.

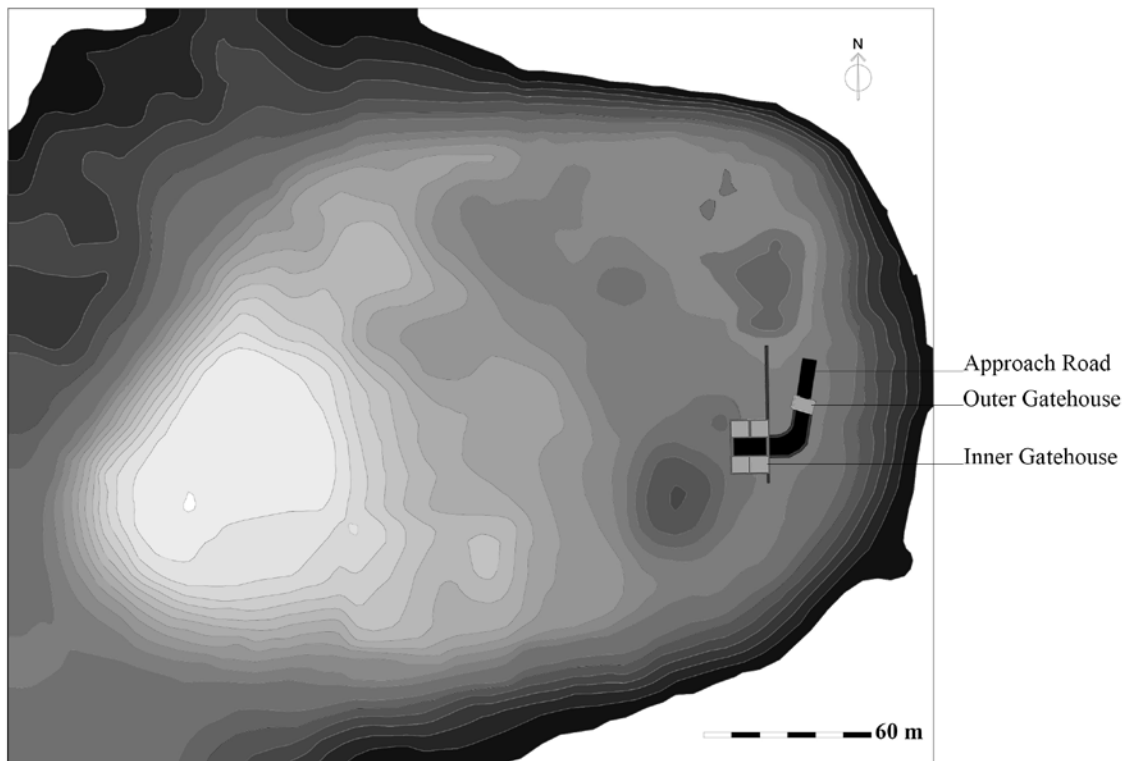


Figure 9. Field B approach road and gatehouse topographic map.



Figure 10. Field B approach road and gatehouse—different phases of the field.

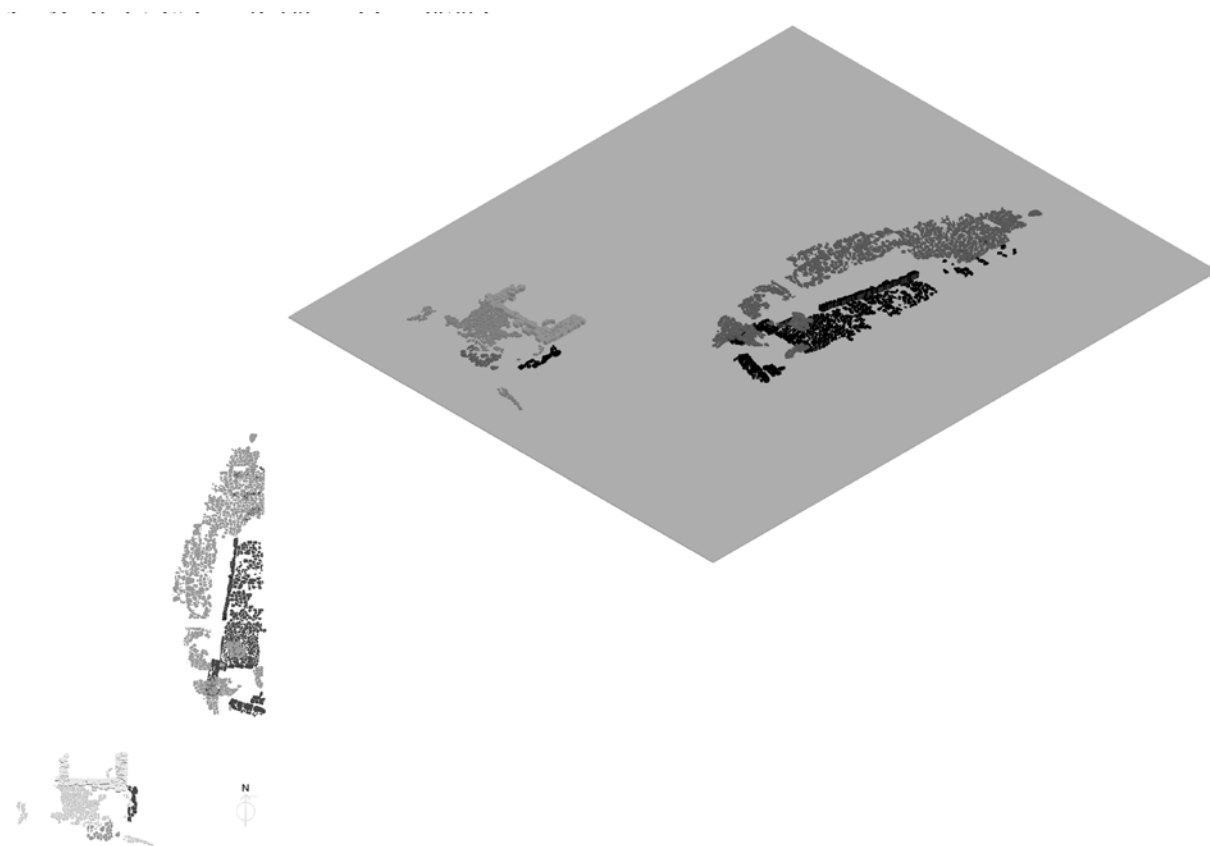


Figure 11. Field B approach road and gatehouse—SE view of extent at time of excavation.

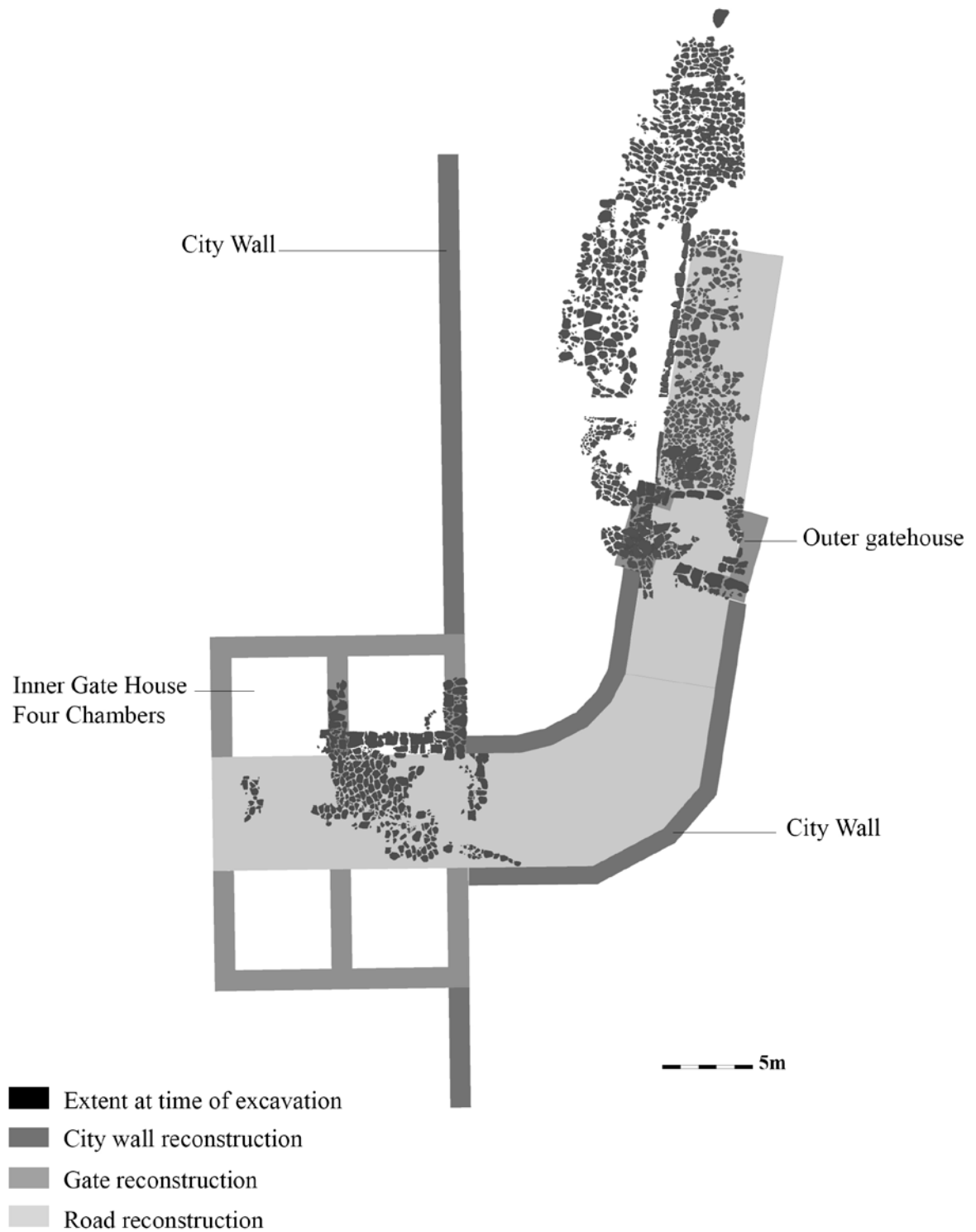


Figure 12. Field B approach road and gatehouse—extent at time of excavation and reconstruction.

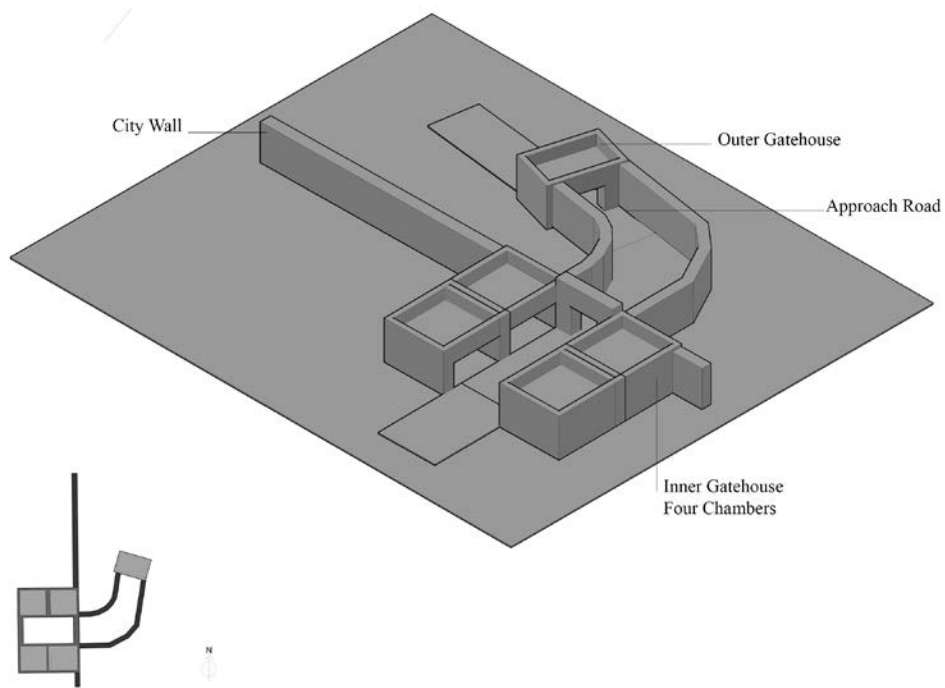


Figure 13. Field B approach road and gatehouse SW isometric perspective.

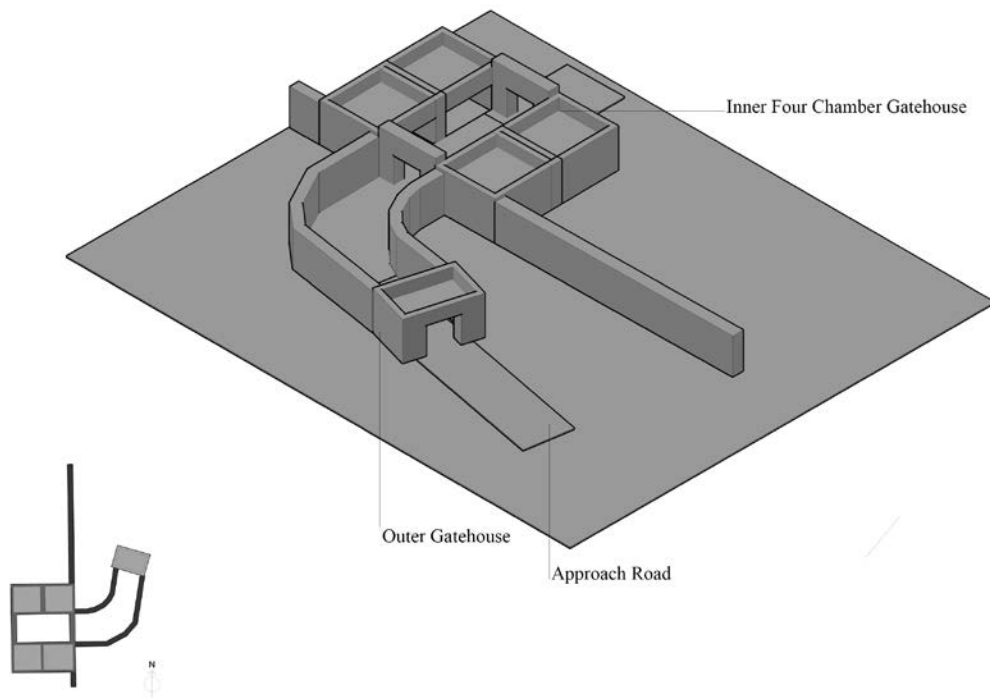
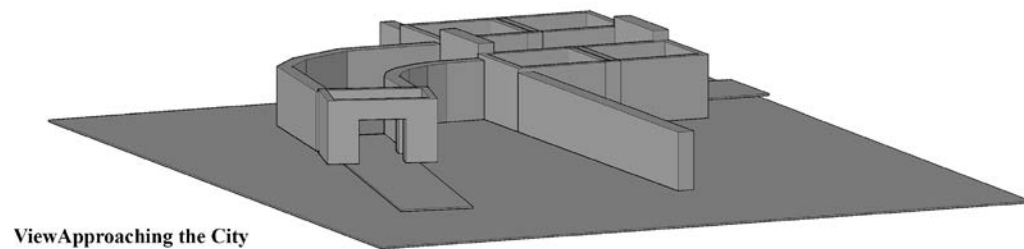
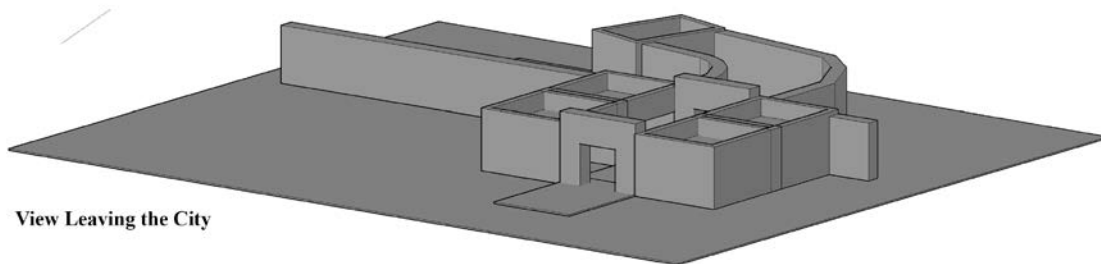


Figure 14. Field B approach road and gatehouse NE isometric perspective.

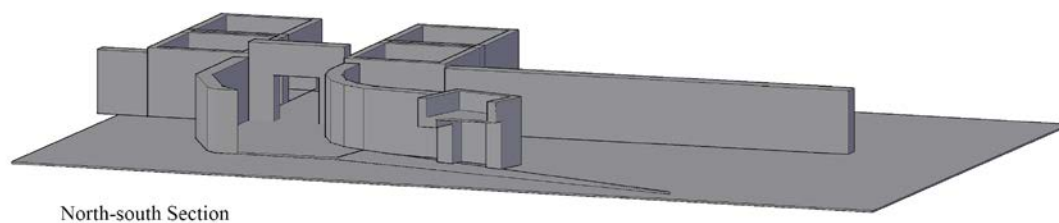


View Approaching the City

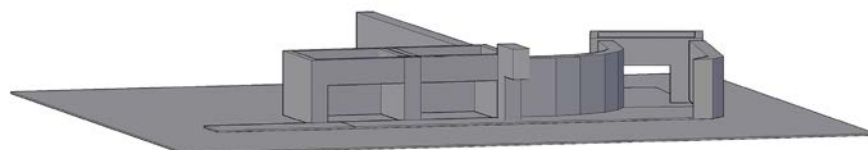
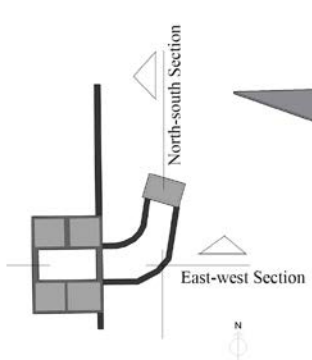


View Leaving the City

Figure 15. Field B approach road and gatehouse reconstruction—perspectives A and B.



North-south Section



East-west Section

Figure 16. Field B approach road and gatehouse—sections.

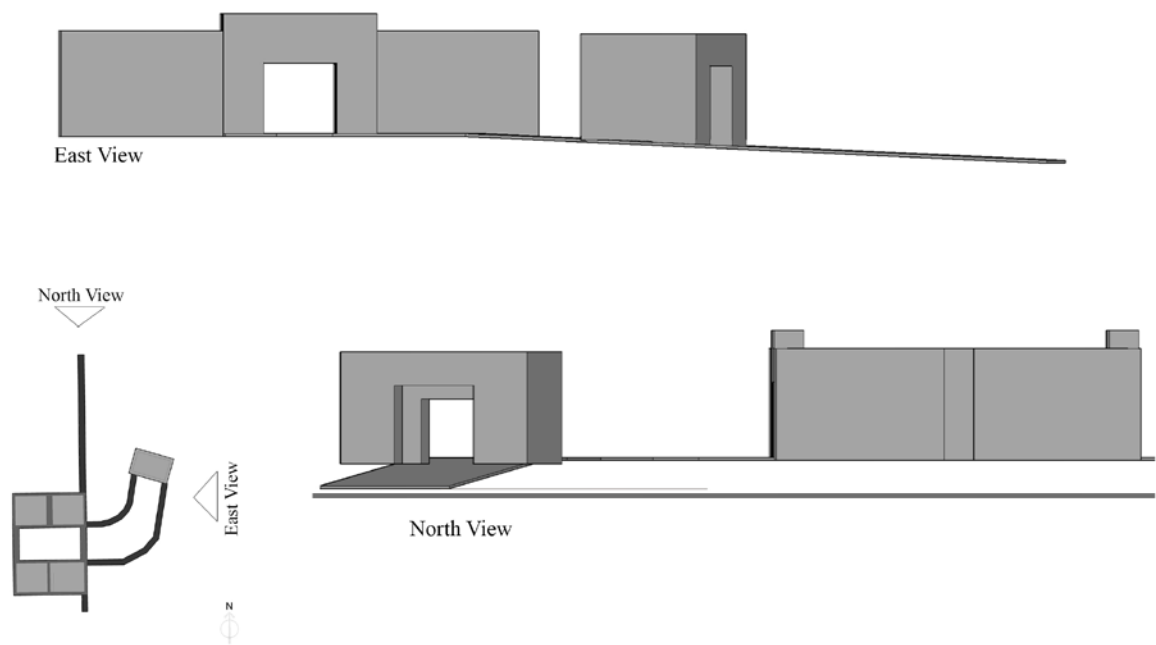


Figure 17. Field B approach road and gatehouse—east and north views.

CHAPTER 2

FIELDS C AND D

Field C Pillared House

General Description of Pillared Houses

The development of domestic architecture can be traced to the seminomadic population that started to occupy permanent villages close to the end of the 13th century B.C. (Netzer 1992). Even though domestic architecture was rising, there was no consistent house plan widely used until the Iron Age, when a house pattern became widely used. It was almost the rule of that time. This house pattern is known as the four-room house. It has nearly no precedents in Canaan (Dever 2001). Shiloh (1970) listed more than 155 Israelite houses that followed the same architectural pattern during this period. Later periods do not yield domestic architectural patterns as consistent and uniform as the four-room house in the Iron Age (Faust 2012: 215).

This type of house is composed of four rooms. The house entrance was usually in the center of the front wall, leading to a large central space generally covered with beaten earth. In both sides of this area there were side aisles or rooms, divided by pillars (fig. 18). The side rooms were often paved with stones (Netzer 1992). Toward the back, the pillars ended in a stone wall with a passage that led to a back room with a dirt floor

(Holladay 1992: 309). The entrance of the house was often oriented to the east, and most of them were preceded by a front yard.

The side and back rooms could be subdivided into smaller rooms. The presence of multiple rooms helped residents to keep the laws concerning female bodily discharges. When such discharges took place, women were considered unclean for some days. If there were multiple rooms in a house, a woman with a bodily discharge could be in a separate room for the days of her uncleanness. Furthermore, the distribution and connection of the rooms made access for unclean women throughout the house easy. From the main room they could go to all the rooms of the house (Hoppe 2013). The subdivision of the side and back rooms was more common in rural areas, where the houses were usually bigger (Faust 2012: 160).

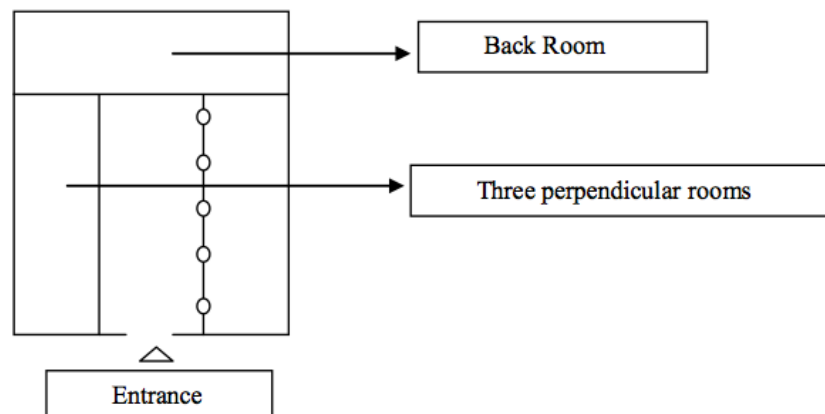


Figure 18. Rooms in the four-room house.

The pillars could be monolith pillars, roughly trimmed chert or limestone rocks, or made of mud brick or wood. Pillars and walls were very thick; this thickness is one

factor that points to the possibility of a second floor. So far no houses with the second floor still standing have been found, but there is evidence which indicates the existence of a second floor, such as stone steps found in Hazor. In addition, a ladder could also be used to reach the second floor (Netzer 1992).

Another thing to consider when suggesting the presence or absence of a second floor is the essential area needed for living. Previous studies have suggested that a family of five needs 10 m² of roofed area per person (Naroll 1962), but if one considers food storage needs, this number can be questioned. A family of five needed 1,800 kg of wheat and 1,080 kg of barley to subsist from harvest to harvest. If they were stored in jars common to that period, 55 jars of wheat and 36 jars of barley would be necessary. This would take an area of approximately 22.75 m², not including the storage of olive oil, wine, and other goods. This shows that, out of 50 m² in total, almost half of the roofed area would be occupied by food storage, leaving only 5.45 m² per person for other things (Holladay 1992: 314).

In addition, the ground floor was used not only for food storage. The finds of the four-room houses also point to the stabling of animals on the first floor. The finds include mangers for donkeys and cattle between pillars; semicircular ground-level mangers for sheep, goats, and cattle; fire pits and hearths for cooking and heating in the courtyard; silos or grain pits in the rear rooms and elsewhere; and cisterns beneath the house or outside (King and Stager 2001: 28-29).

Figure 19 is a schematic reconstruction of the ground level of a four-room house.

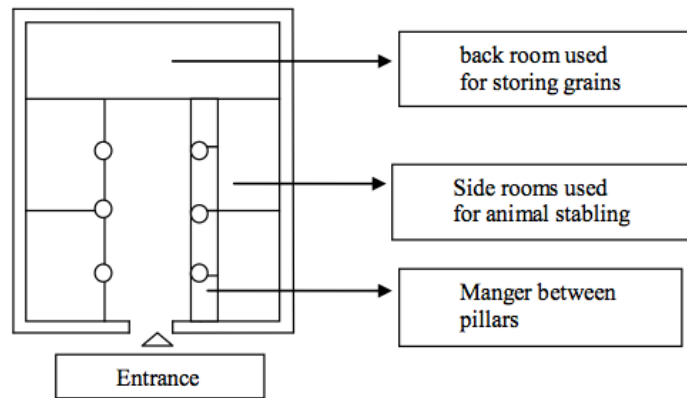


Figure 19. Ground level of the four-room house.

Since animals and agricultural products were on the first floor, people probably dwelt on the second story. While the ground floor was used for economic purposes, the upper floor was for human use. It probably included space for living, light storage, and in some cases it could have a hearth or fire pit for cooking. With a second floor the house area would double: instead of 10 m² per person as suggested by Naroll (1962), it would have approximately 20 m² per person. A house plan with two floors fitted the requirements of a family's activities. Its design offered space for animals, agricultural produce and production, and living. It was a perfect farmhouse for that time and culture.

The four-room houses could be located inside and outside cities. Their presence within cities is not very common, since they demanded more area to build. When a four-room house is found inside a city, it indicates that it belonged to an extended or wealthier family. This pattern changes in rural areas, where four-room houses are predominant (Faust 2012: 225).

There are some variations of the four-room house; the so-called three-room house is one of them. The three-room house lacks one of the front long rooms. It has two front rooms, instead of three, and one back room. The pillars are still present, but there is just one row of them dividing the front room in two. The three-room house may be a subtype of the main type, the four-room house (Faust 2012: 215), or a predecessor of the four-room house.

The three-room house (fig. 20) was smaller and more common in cities (Faust 2000), where not much space was available. The three-room house usually did not have the side and back rooms subdivided into smaller rooms. The three-room house was usually inhabited by a nuclear family: a father, mother and usually two children (Faust 2003). There are some clusters of three-room houses sharing a common space, but each house unit had its separate entrance. These compounds can be interpreted as being occupied by the extended family. However, after decades, the city would not have more space available to keep these clusters growing as families grew (Holladay 1992: 310). There is a third variation of the main type four-room house: the two-room house (fig. 21), which consists of a back room and a front room.

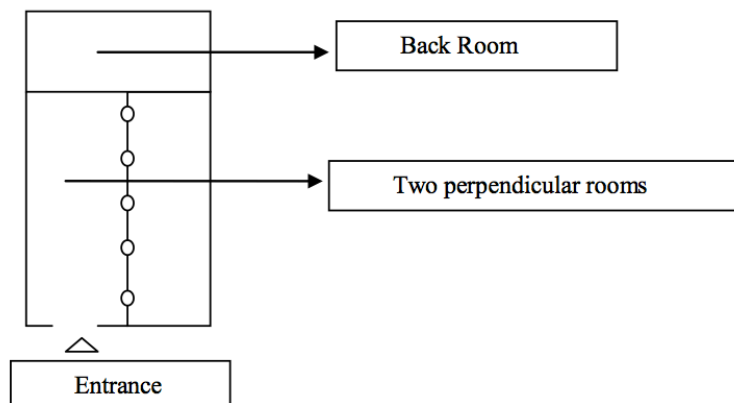


Figure 20. Three-room house.

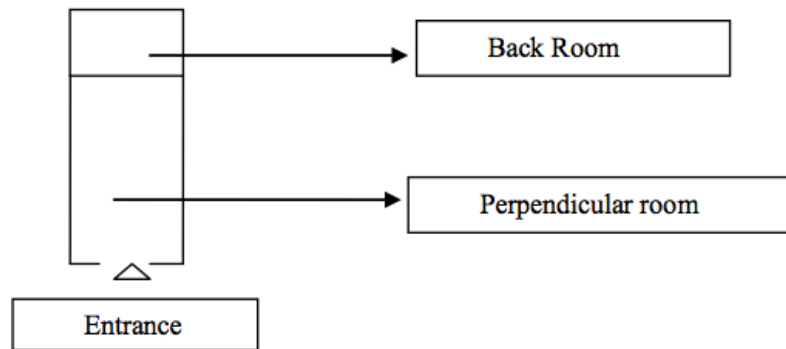


Figure 21. Two-room house.

Four-room houses from the Iron Age in Israel do not show much variation in size and shape. There is much uniformity (Faust 2012: 215). The differences are in the number of rooms, the materials used to build them, and a small variation in the total area; the organization, distribution, and connection of rooms are still the same. The differences present in these houses are still small if one considers the differences seen in houses today.

The uniformity of four-room houses, independent of the political or economic situation, in small or large cities through the Iron Age, shows that they were a standard plan for buildings. This standardization brought and strengthened the “we-ness” of its users, their values and ideology as a unique people (Faust 2012: 216-29).

The idea of equality was not new for the Israelites. When they left Egypt, they lived for 40 years in tents, which could not have been very different from each other. God also made provisions for social equality.

However, when domestic architecture is analyzed in Jordan, differentiation among the types of buildings arises. The four-room house common in Palestine is not often seen in Jordan. There are only a few examples of it and its variations. Nevertheless, other building types are very common for domestic architecture, namely multi-room structures that varied from one another within the same site and during the same period (Daviau 1999: 113-36). This diversity in the Ammonite domestic architecture strengthens the argument that the four-room house was part of the Israelite identity (Faust 2012: 219).

Comparison with Similar Structures

One of the structures excavated in Field C in Tell Jalul could be identified as a four-room house in one phase (fig. 22). The building went through several modifications (fig. 23). Later, it was remodeled into a three-room house. Denudation and centuries of use substantially damaged the ruins, but the main characteristics of a four-room house were present in Phase 10, the earliest phase of the field that contained architectural remains (Ray, forthcoming).

In Jalul's pillared house (Phase 10 four-room house), there were three parallel rooms in the front divided by pillars and a broad room in the back perpendicular to the three front ones: the main characteristics of a four-room house. The house entrance was in the front central aisle as expected, but it was not centralized: it was slightly to the west. Also, the house entrance was not on the east wall, but on the north (figs. 24-25, 27).

The flooring did not follow the expected pattern of side rooms paved with flagstones and a center aisle covered with beaten earth. The house was laid straight on bedrock and was covered with a mixture of nari plaster, cobble, and beaten earth (Ray forthcoming). The walls were 1.5–1.9 m wide, which was expected in order to support a

second floor. Even though stone steps were not found, it is possible to suggest the presence of a second floor, because many houses used a ladder to reach the second floor (fig. 26). The ground-floor-level area was around 130 m² with the walls; considering only the living area, it was around 80 m². All this may indicate that the family living in this house either had seven members or was wealthy.

A unique feature of Jalul's pillared (four-room) house is a cave located in the center of the central aisle (figs. 23-24, 28-29). The lack of plaster inside the cave indicates that it was not used as a cistern. Instead, it was probably used as a storage space (Gane et al. 2010). The location of the cave in the center of the house may imply that the house was built to guard the cave entrance and limit the use of the cave. The cave was used during Phases 10 and 9. Among the interesting finds in the house is the stone basin (figs. 23-24), of Phase 10, found within the bedrock on the west aisle of the front rooms. This may point to cooking activities in this area.

The following occupational phase of this building, Phase 9, is marked architecturally by the reconstruction of the west wall to the east, making the house smaller and eliminating one row of pillars (fig. 23). Phase 9 of this building can be considered a three-room house (Ray, forthcoming). This might have happened due to the growth of the city forcing builders to make smaller houses in order to fit more units inside the city. This second phase is roughly contemporaneous to the remaking of the gate and the approach road, which indicates that during that period the tell went through a rebuilding effort.

In addition, the location of the house within the city is crucial. It is between the city gate and the acropolis passing by the water reservoir (fig. 49). Looking at the

topographical map of the city it is possible to see that entering the city, a person would first pass the gate. Then, there would probably be a plaza or square that was part of the gate complex, followed by the water reservoir. After that, the four-room house would appear, aligned with those structures leading to the acropolis. If there was a road crossing the tell from the gate to the acropolis, this road would pass by the four-room house. In the tenth century B.C. there were two basic planning principles in cities: orthogonal and peripheral (Herzog 1992b: 247). Both of them included a main road crossing the city from the gate to the other end of the tell and reaching the city wall.

History of Excavation

The excavations in Field C began in 1994. They focused on the remains of a pillared house that partly covered the original four squares (C1-4) of the field. In that season a stretch of a wall was unearthed beneath a wall of the Iron II period and could be dated to Iron Age I. Close to the wall there were some collapsed mud bricks that contained typical Late Bronze and Iron I Age pottery (Younker et al. 1996), pointing to an occupation during the period. Unfortunately, due to stone robbery, the western wall of this building was removed not long after it went out of use. Later, in 1996, a new square was opened (C5) and the outer edge of the southern wall was unearthed.

In 1999, Late Iron I and Late Bronze Age sherds were exposed in Square C5 by the south wall. Also in Square C5, a pavement from Iron Age II and a wall and a pavement from Late Iron Age II were unearthed. The most interesting find of the season was a cave inside the pillared house that had been sealed by the roof collapse of the Late Iron II building (Younker and Merling 2000). Builders then brought earth fill to cover the debris from previous phases and made a beaten earth floor for the building (figs. 30-31).

Inside the cave, more than 20 skeletons without careful burying were found; each skeleton was dumped in a different orientation. At the end of the season, the four original squares reached bedrock.

In 2010, Field C was not opened, but the field director was working on the tell in other areas and noticed that the northern balk had eroded, exposing several stones that appeared to be part of a wall (Gregor et al. 2011).

In the following season, 2011, the northern building was resumed after more than a decade. The north balk from Squares C1-2 was removed to clarify the architectural plan of this building. The removal of the balk revealed at least two phases of this wall that were partly exposed by erosion (Gregor et al. 2011).

Field C also uncovered a building to the south that dates to the same period as the pillared building of Field D. Their walls are in the same orientation, indicating that they might be part of the same building. Therefore, they will be discussed together below.

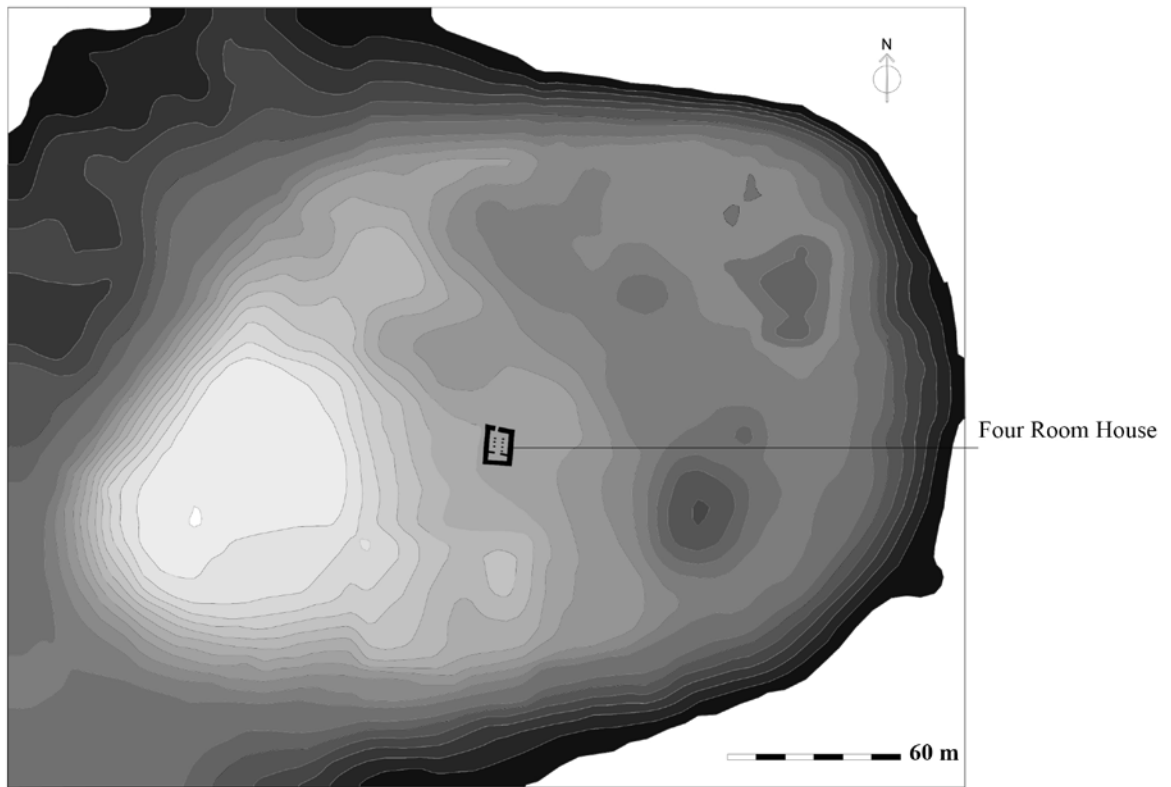
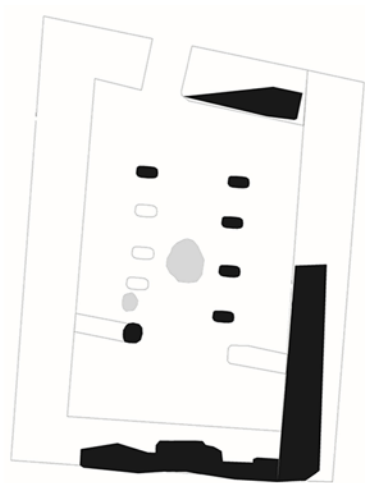
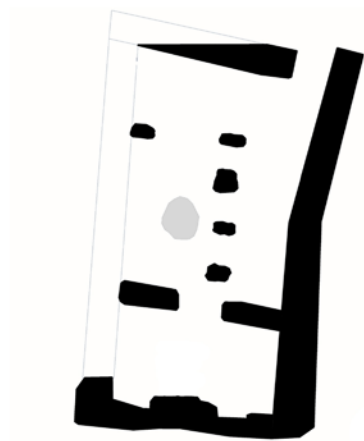


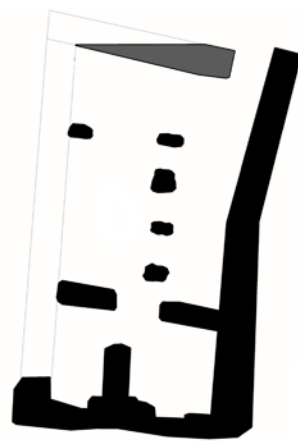
Figure 22. Field C four-room house topographic map.



Phase 10



Phase 9



Phase 8

Figure 23. Field C pillared house Phases 10, 9, and 8—reconstruction top plan.

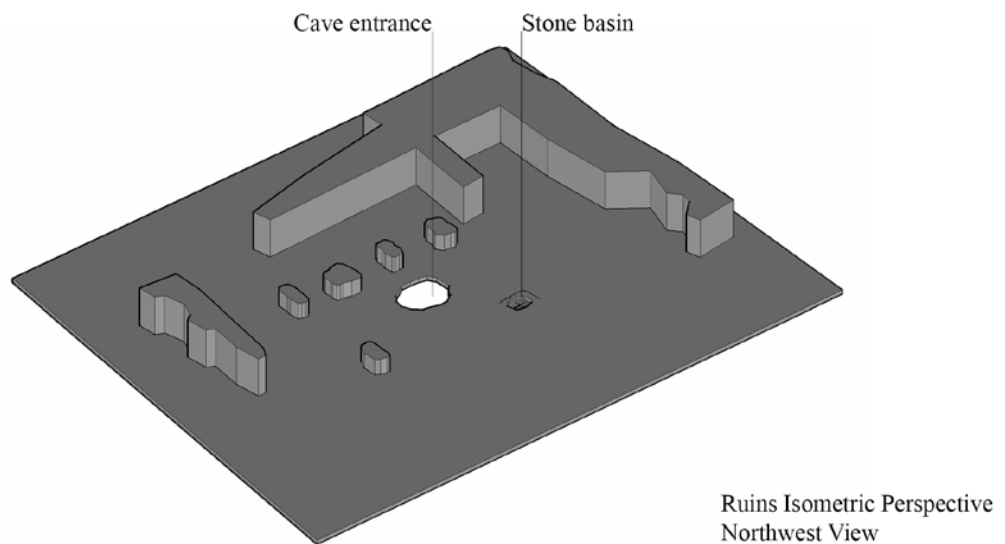
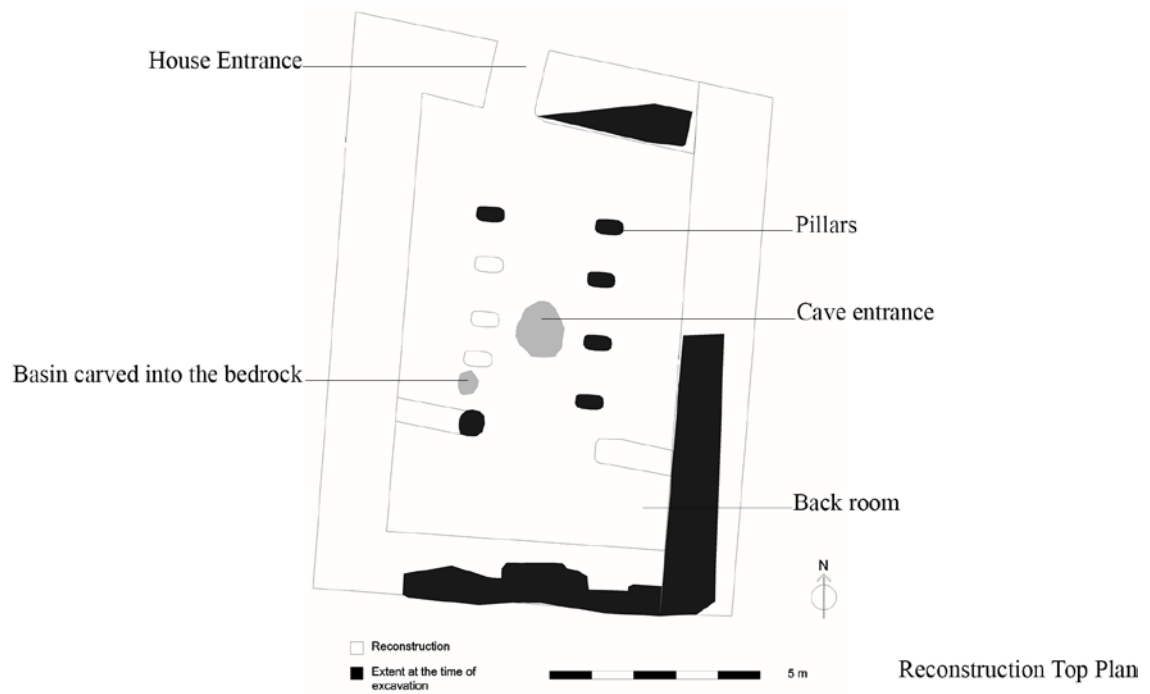
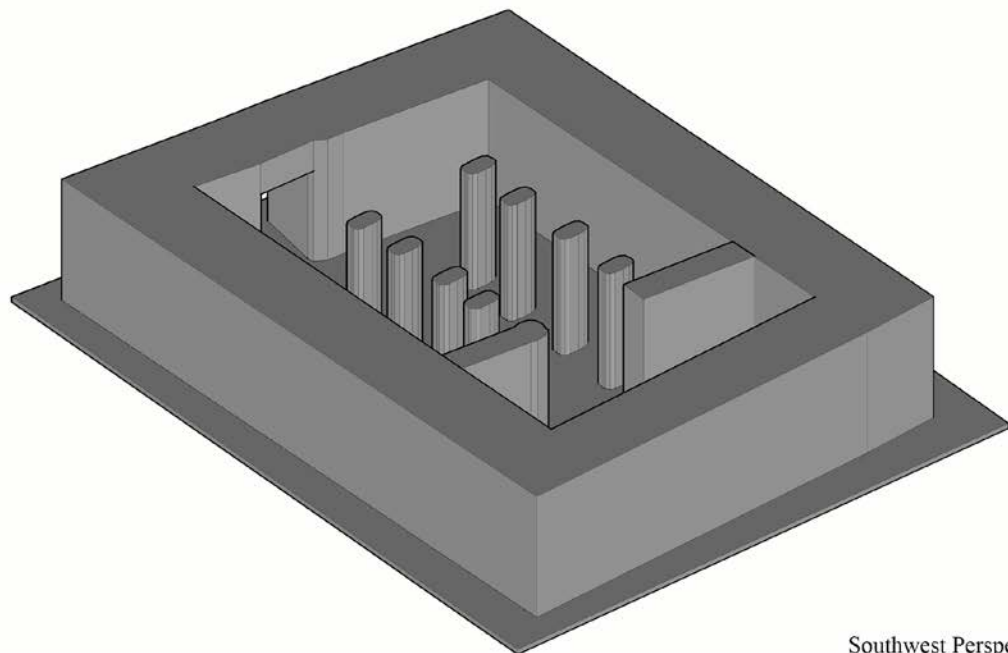
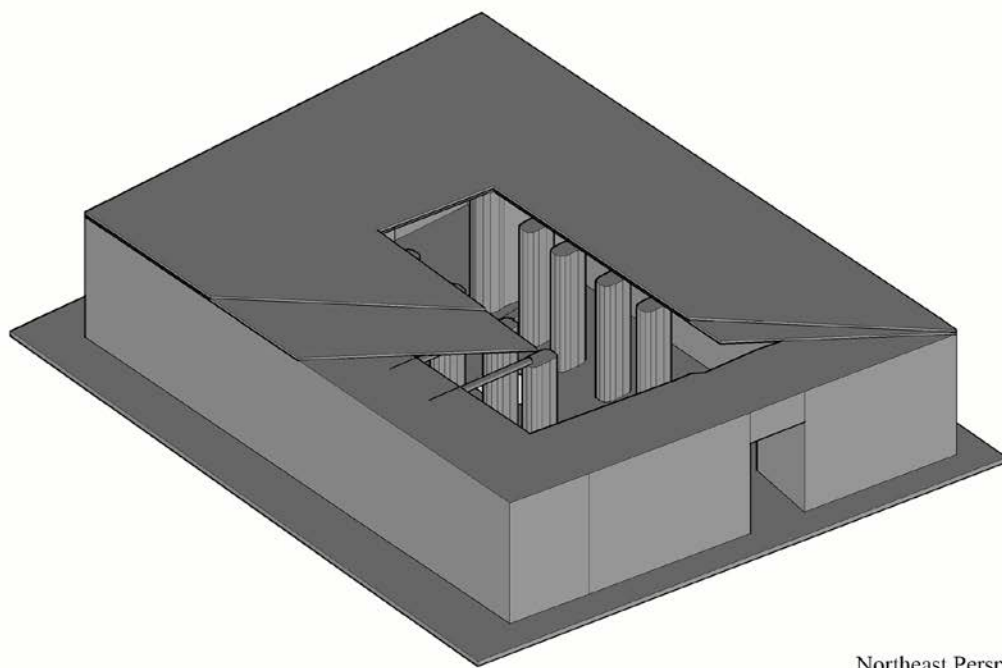


Figure 24. Field C pillared house Phase 10—reconstruction top plan and ruins isometric perspective.

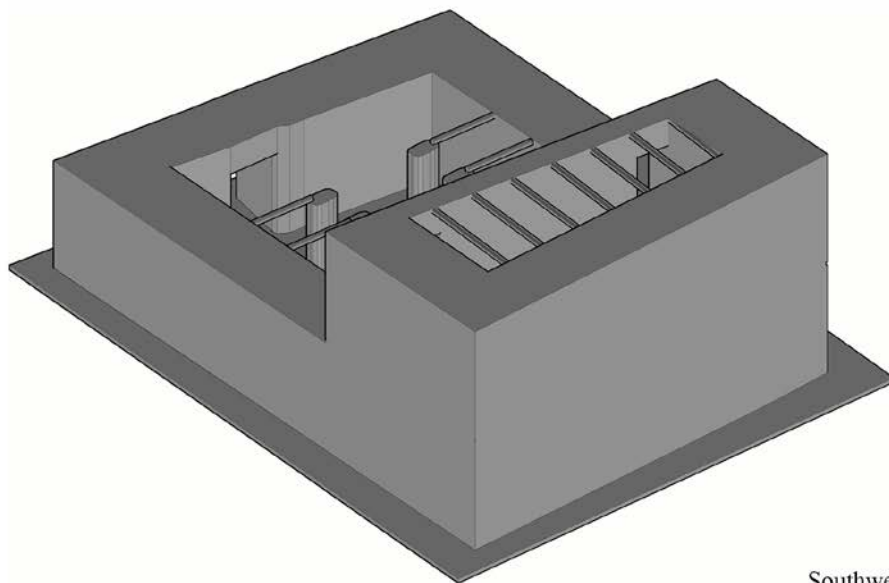


Southwest Perspective

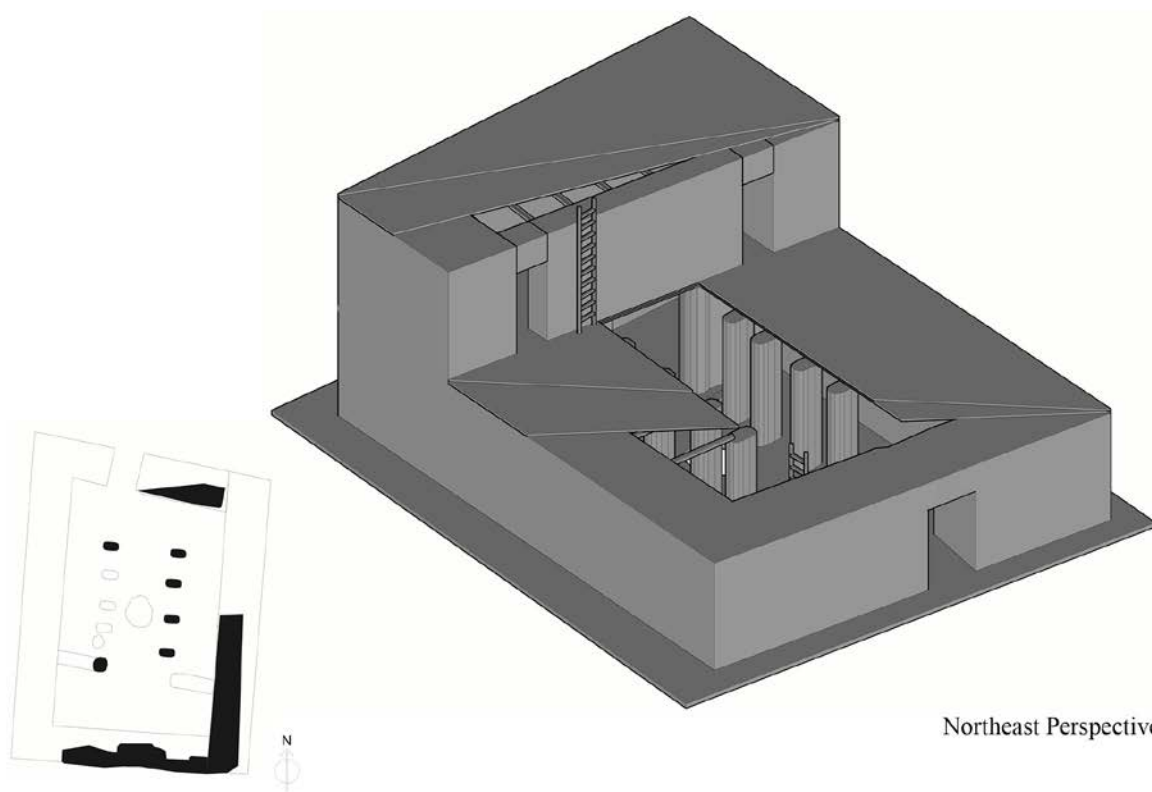


Northeast Perspective

Figure 25. Field C four-room house—isometric perspectives of ground floor.



Southwest Perspective



Northeast Perspective

Figure 26. Field C pillared house Phase 10—isometric perspectives of two-story reconstruction.

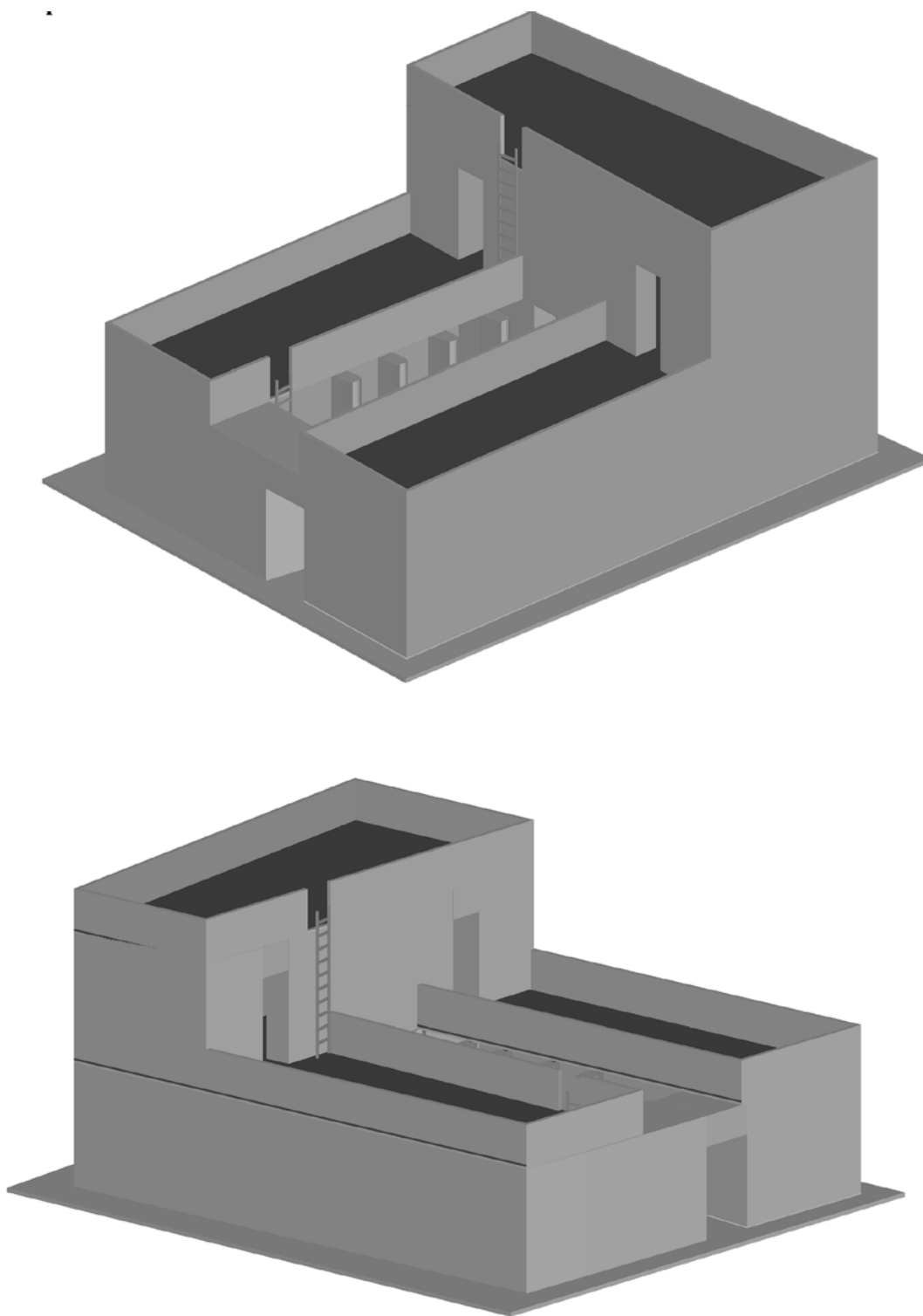
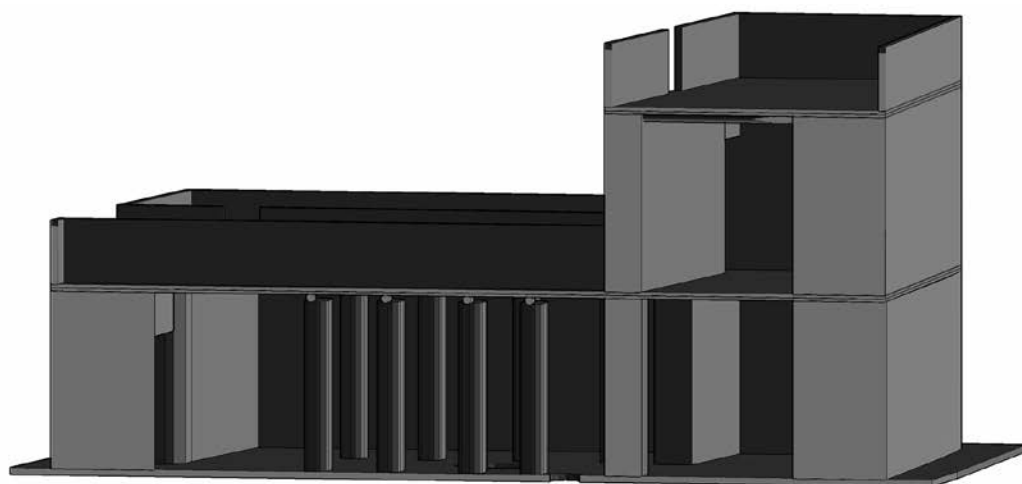
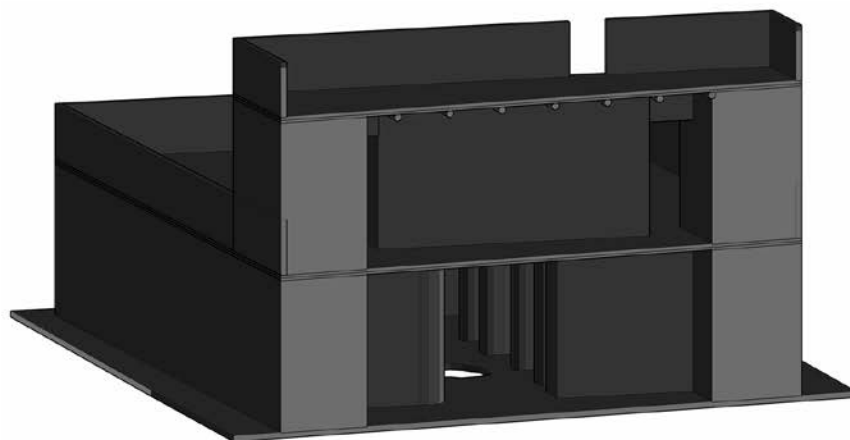


Figure 27. Field C pillared house Phase 10 perspectives.



North-South Section



East-West Section

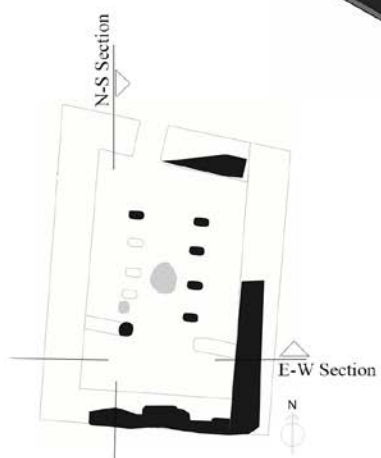


Figure 28. Field C pillared house Phase 10 sections.

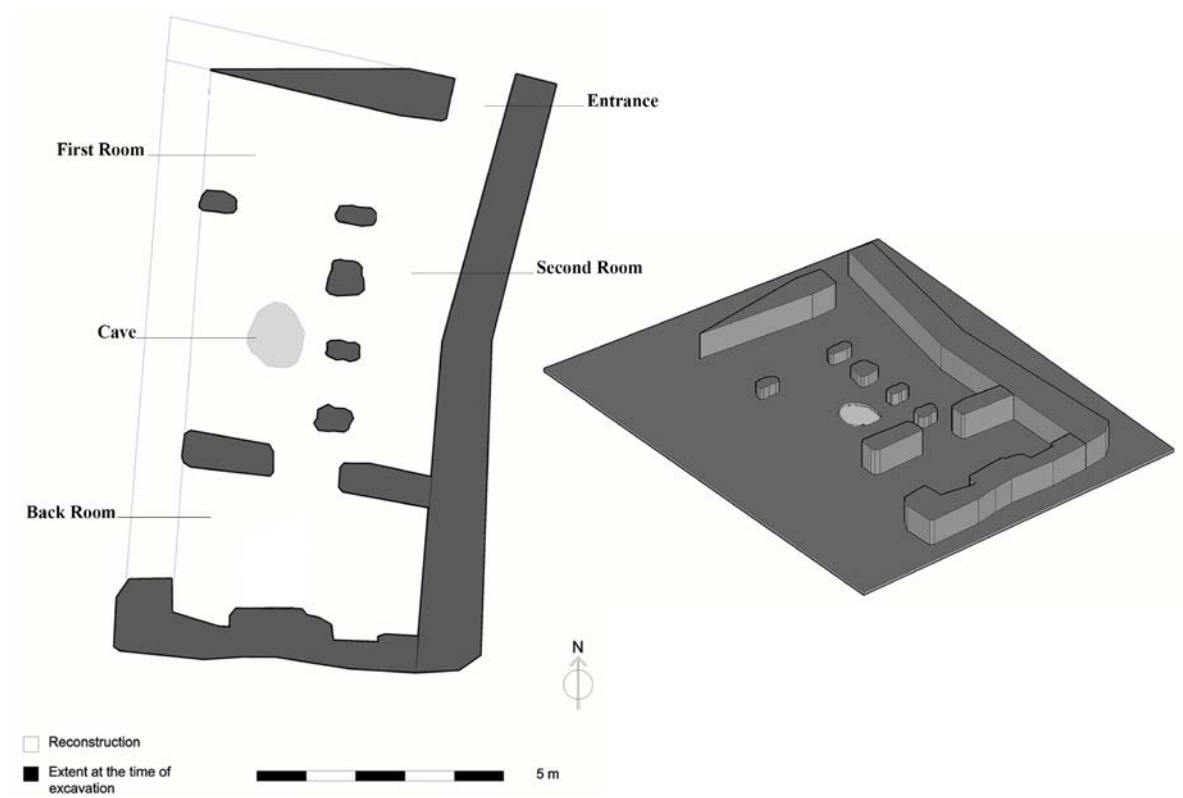


Figure 29. Field C pillared house Phase 9—reconstruction top plan and ruins isometric perspective.

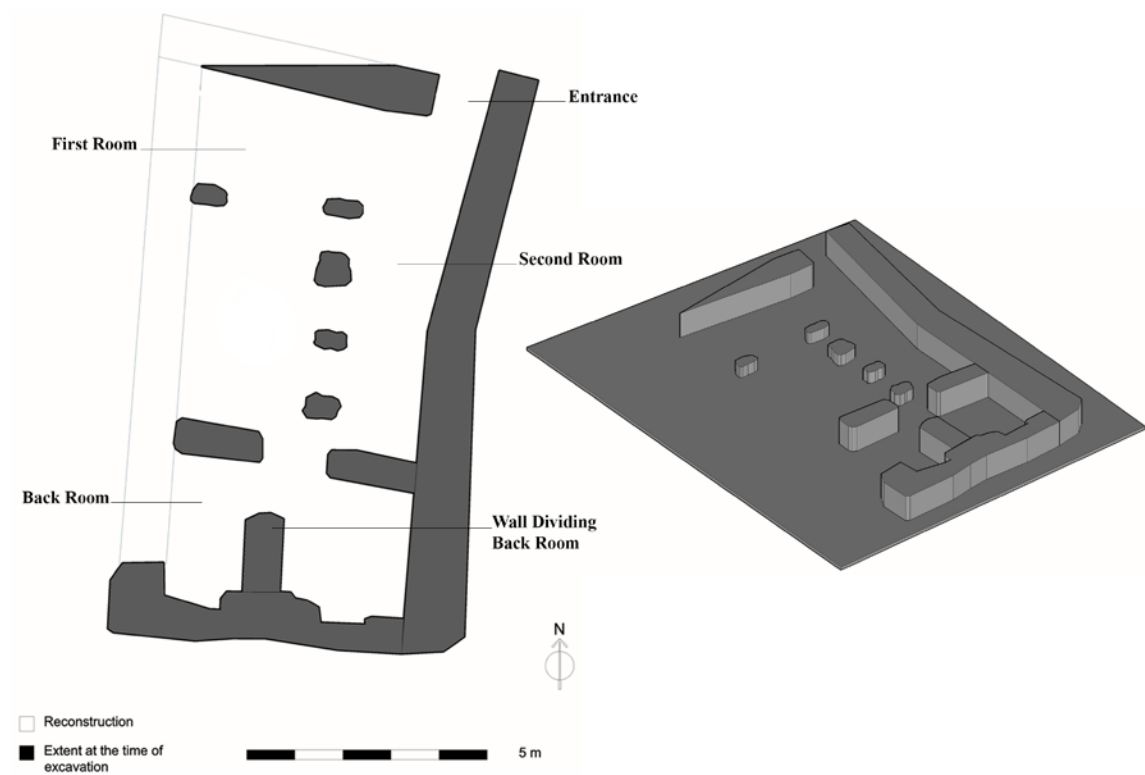
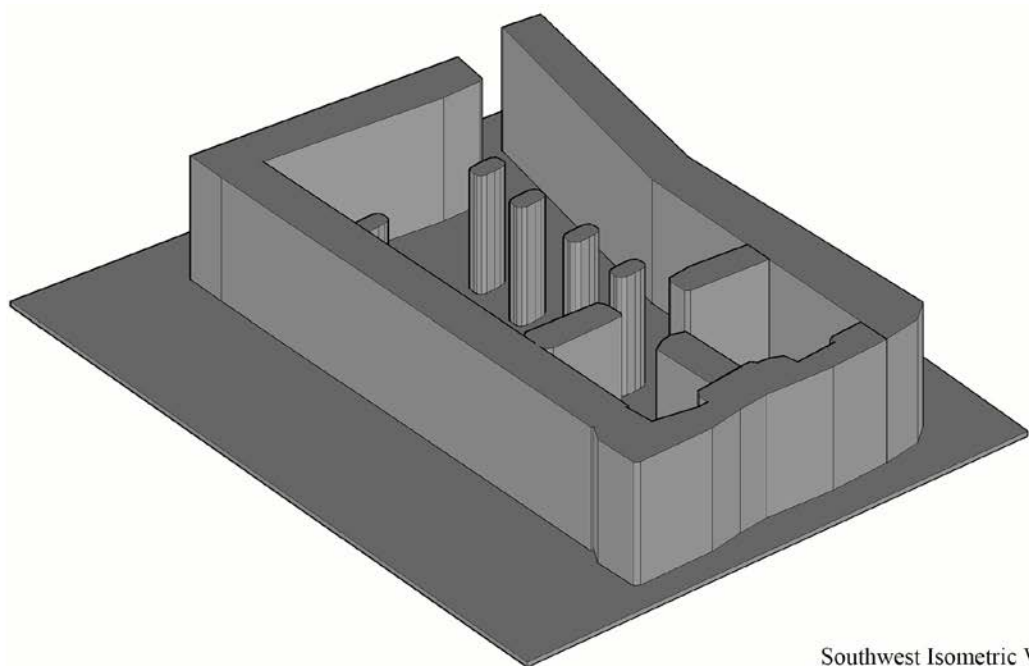
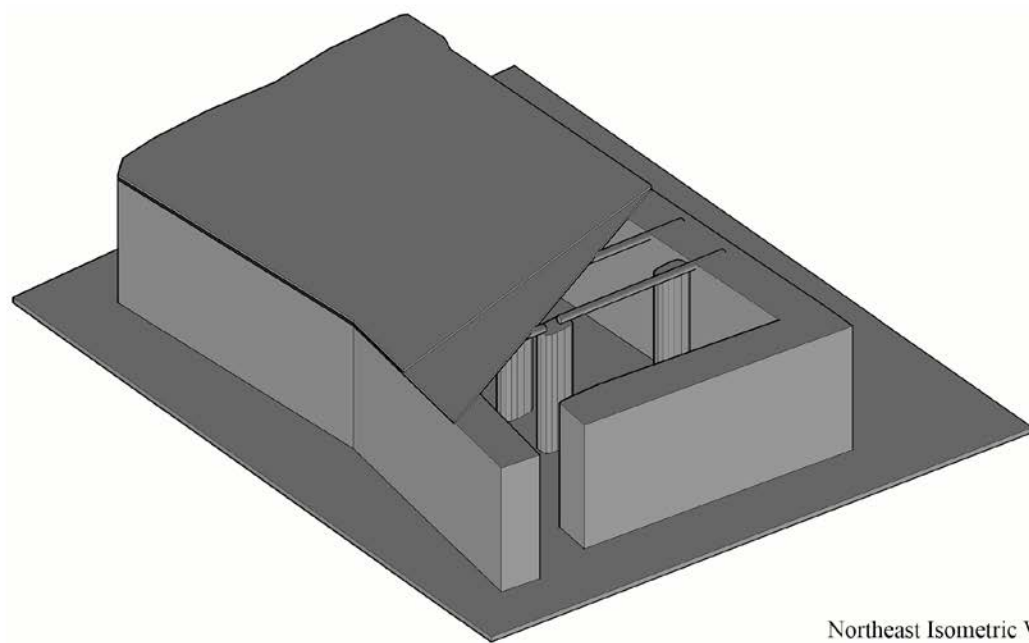


Figure 30. Field C pillared house Phase 8—reconstruction top plan and ruins isometric perspective.



Southwest Isometric View



Northeast Isometric View

Figure 31. Field C pillared house Phase 8—isometric perspectives.

Field D Open-Court House

General Description of Persian Period Open-Court House

The Persian building known as the open-court house has a central courtyard surrounded by rooms, with the following characteristics: straight, closed-lined outer walls forming a square or rectangular shape; similar thickness and building technique in the inner and outer walls; usually straight walls with straight angles; a central open court determining the whole design of the building; no front main entrance, with access usually through a small side entrance; inner entrances frequently in the middle of the wall; a drainage system; and a double row of rooms on one side of the court (Amiran and Dunayevsky 1958).

To the above characteristics listed by Amiran and Dunayevsky (1958) the following can be added: shallow niches; a thick plaster floor; terra-cotta pipes used for the drainage system; thick walls of *terre pisée* thresholds with doorpost sockets in a deep cavity covered with horseshoe-shaped stones with a molded profile; mud-brick arches; location on a raised platform; and a staircase (Reich 1992).

The findings in the open-court buildings suggest that they were used for public and domestic purposes. The architecture does not present any difference between the two functions; the difference can be seen only in the artifacts found. In addition, awareness of security and defense can be noticed through the thickness of the walls and the massive size of the buildings. Some buildings with this plan were used as fortresses.

The origin of the open-court building in Palestine and the Transjordan can be traced to the Assyrian period, since it appeared in Palestine at the beginning of the Assyrian influence (Amiran and Dunayevsky 1958) with Tiglath Pileser III's invasion of

the northern part of the Israelite kingdom (Reich 1992) and continued without modification in the Babylonian and Persian periods (Stern 1982).

This continuity can be seen in the Persian royal cities, Persepolis and Susa, which present some elements of the open-court house. Susa had its royal palaces built as many open-court houses put together. Persian emperors had the capacity for large-scale planning as well as practical administrative ability (Pope 1965), essential traits to make constructions reach a high degree of complexity. These rulers not only produced large building complexes, but also highly sophisticated structures, clearly seen in the royal cities. This refinement in the construction techniques can be seen in the straight walls with straight angles in the Persian period.

There is a debate about the division of the different plans of the Persian open-court house. Some scholars say that they can be divided into two groups: closed courtyard, surrounded by rooms on the four sides; and opened courtyard, having one or more sides without rooms (Amiran and Dunayevsky 1958). Others say that it is all the same thing and the differences found at the time of excavation are just a result of deterioration and stone robbing (Stern 1982). Others say that this classification is too general and not entirely accurate, and that these buildings should be classified according to the architectural concepts established by Loud and Turner (Reich 1992).

There is a lack of Persian-period building remains in Palestine (Stern 1982). This absence can be explained by the fact that many mounds were abandoned after the Persian period, leaving the Persian-period building remains on the top exposed to denudation. In addition, at the sites where there was further settlement in the Hellenistic-Roman period, construction activities destroyed a great part of the Persian occupation. Furthermore, the

majority of the large sites excavated from this period had most of their area occupied by a large building, palace, or fortress.

Comparison with Similar Structures

In Jalul's Field D, ruins of a Persian-period building that looks like an open-court house were uncovered. In Field C, ruins of a Persian-period structure were revealed that might be part of the same open-court house found in Field D (figs. 32-33). These structures are dated to the same period; the walls follow the same direction and are close enough to be part of this kind of large building (Ray, forthcoming). Further excavations have to be done in order to materialize this hypothesis. However, in this thesis they will be studied together.

The structure found in Field D clearly consists of a courtyard surrounded by rooms. So far, it looks like the courtyard from Jalul is rectangular like the ones in Megiddo. No drainage system has been found in the building, but there is a water channel in Jalul dated to the Persian period (Younker et al. 2009) that could be part of a city drainage system, indicating the possibility of other drainage channels/pipes that fed it. Nevertheless, no terra-cotta pipes have been found. The complete water system of Jalul will be discussed in chapter 3.

One of the rooms of this building had a dirt floor; however, typical open-court houses had their floors covered with thick plaster. Furthermore, the walls were considerably straight. The only exception is wall D1:34, which had a protuberance. However, it is the only wall of the building like this. Thus, it is possible to say that this protuberance might be the result of an earthquake, later activities, or intentional planning to accommodate a certain need. The wall angles are also straight. No evidence that the

building in Jalul was laid on a platform or that there was a staircase has been found to date.

Two large open-court buildings have been totally excavated in the Transjordan. One of them was in Tell Es-Saidiyeh. It measures 21.95 m by 22.05 m (Pritchard 1985). The building had an internal courtyard with four sides surrounded by rooms. According to Pritchard, this building can be dated to the Persian period. Another site in the Transjordan that had an open-court building is Buseirah. Open-court house examples can also be found at Hazor, Lachish, Tell Jemmeh, Megiddo, Tell Qasile, Tell el-Farah, and other sites (Stern 1982).

History of Excavations

This section on history will touch on two different fields because the open-court house is laid in two fields. Field C will be the first one to be described; then, the history of excavation in Field D will be summarized.

Excavation in Field C paused for six years after 1999, and work resumed there in 2005. Three new squares were opened (6-8) during that season. A wall previously found in Square 5 continued to be traced toward the east in Square 6; part of another structure east of the pillared-house and two superimposed floors were located (Younker et al. 2007). In Squares 7 and 8, most of the 2005 and 2007 seasons were spent removing large amounts of earth and rubble debris with the purpose of reaching the earliest floor levels of this southern building.

In 2009, excavations revealed remnants of the eastern wall, a paved courtyard, and subfloor earth layers. Thus, what in 1996 was only a wall, at the end of the 2009

season became evidently part of a large building (figs. 34-36). This structure is dated to the Iron Age II/Persian period (Younker et al. 2009).

In Field D, excavations began in 1996, where four squares were opened in an attempt to uncover the rest of the large building complex partially uncovered in Field C (Younker and Merling 1997). During the first season, a number of wall lines that looked like a domestic structure were exposed (Younker et al. 1997).

In 1999, the four original squares were opened again. Excavations touched on a collapsed roof and other debris. At the end of this season it was possible to conclude that the building consisted of a courtyard surrounded by rooms (figs. 37-39). Pillars were also unearthed, suggesting the presence of pillars to support a roof, probably a porch by the courtyard (Younker and Merling 2000).

In 2005, the collapsed roof was removed from the rooms, exposing several whole vessels and some figurine fragments. In this season, the field was extended with two more squares opened to the west, D7-8, to clarify the rooms previously excavated in Squares 1 and 3 (Younker et al. 2007).

In 2009, the balks were removed due to their eroded-nature. Four dirt floors were identified. Also, a blocked doorway was unearthed. A 3 m high wall and another 2.5 m high one were excavated. The two walls revealed the same kind of openings, two divided by a pillar. They were at the same level, indicating that they were contemporaneous. One wall was to the north of the courtyard and the other wall was west of the courtyard. In addition, five courses of mud brick wall were uncovered in the southeast corner of Square 4 (Gane et al. 2010).

The building had different phases of occupation, but all were within the late Iron II C/ Persian (fifth to seventh century B.C.) (figs. 34-39).

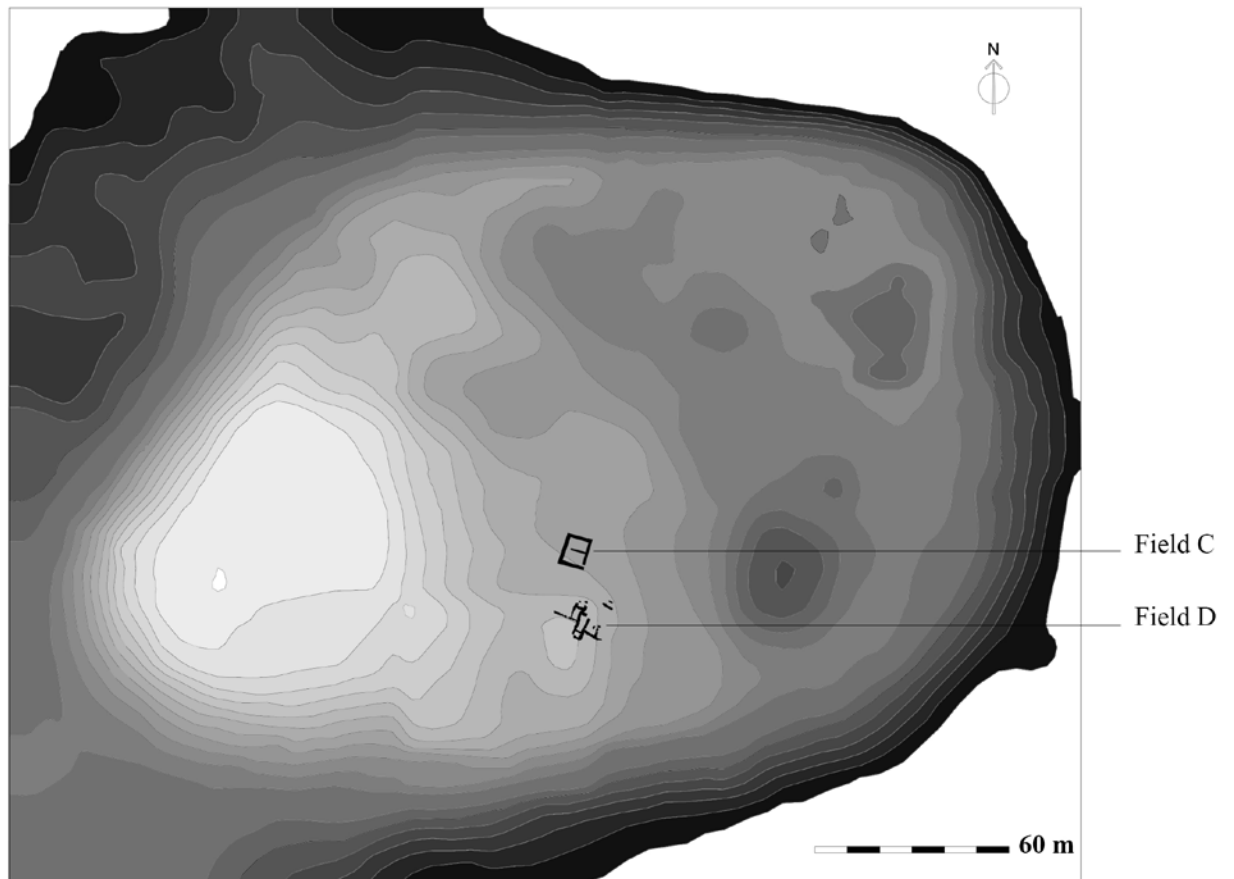


Figure 32. Fields C and D open-court building topographic map.

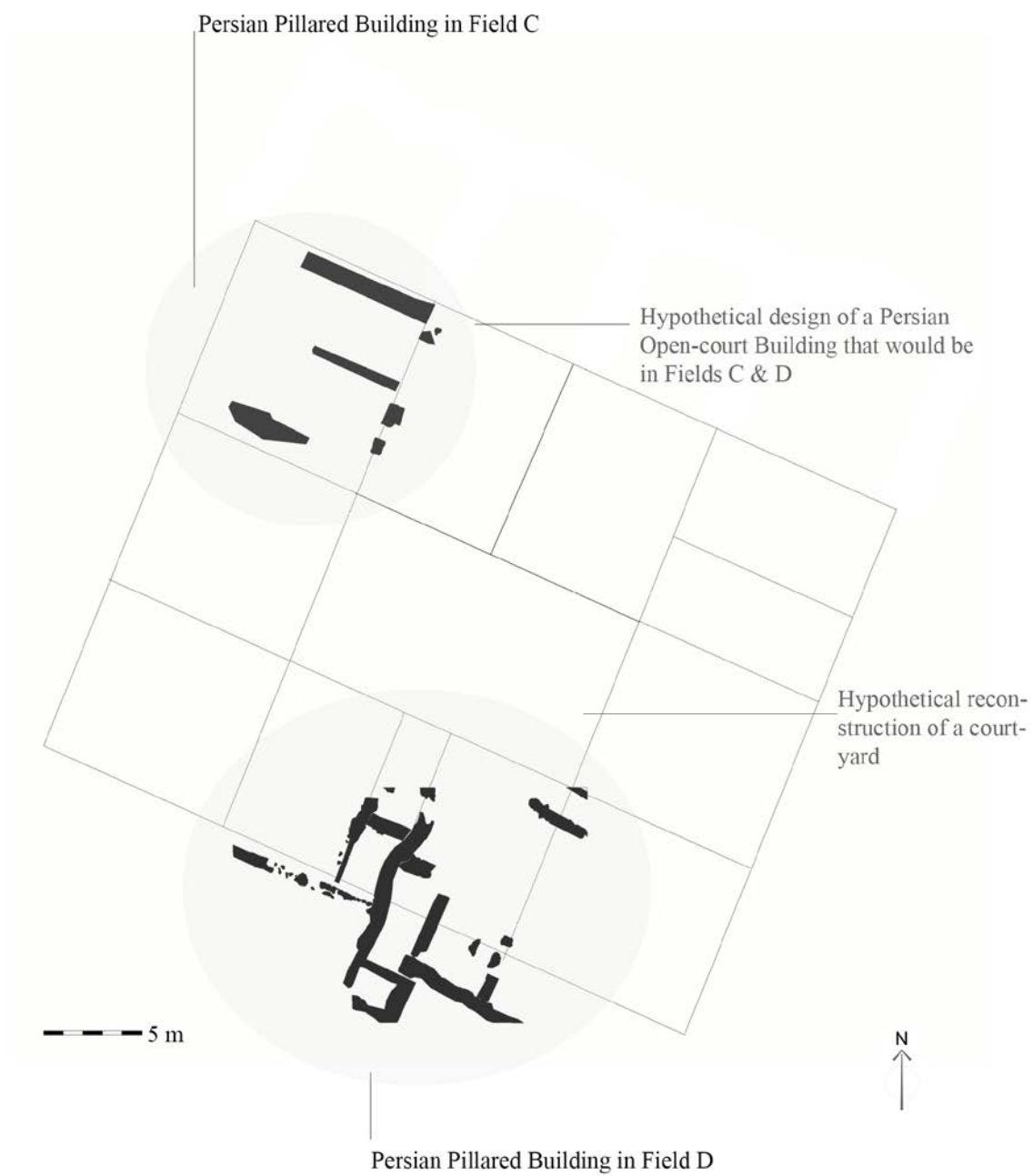


Figure 33. Fields C and D open-court pillared building top plan reconstruction.

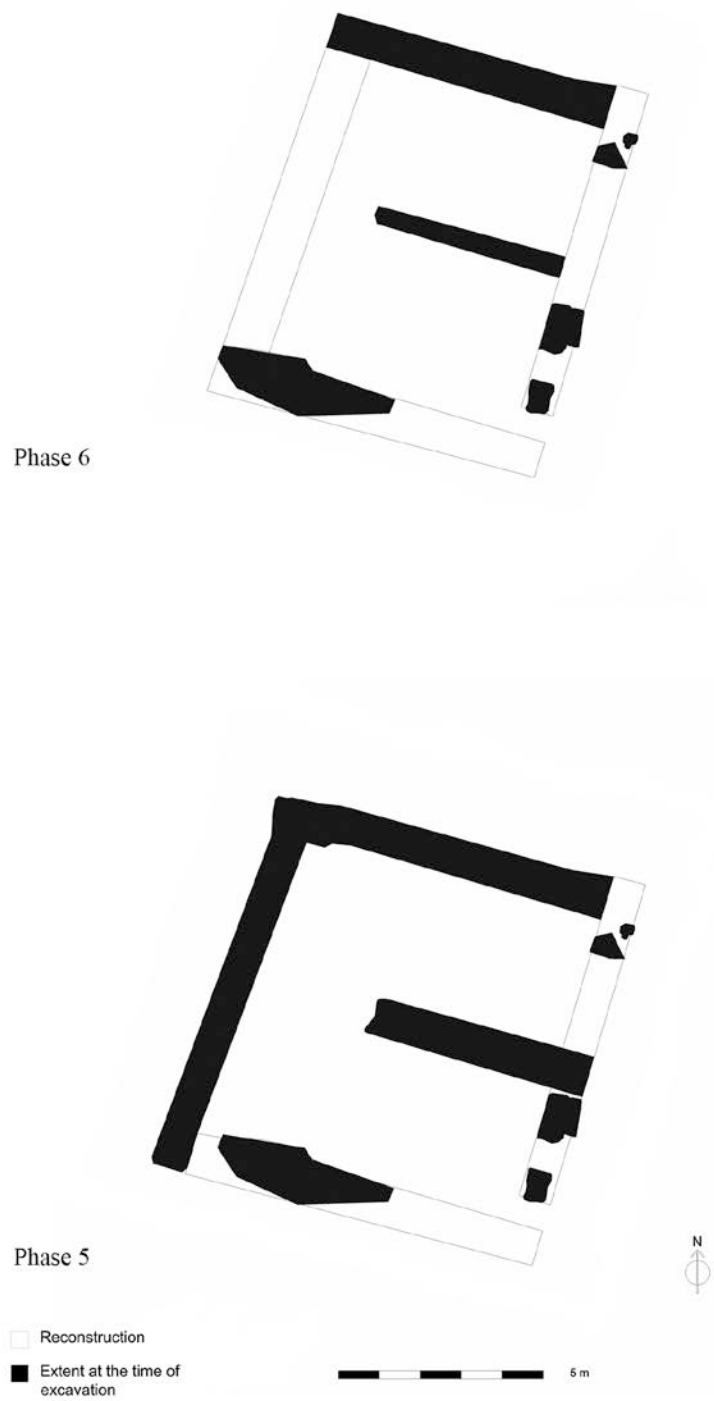


Figure 34. Field C Persian house top plan Phases 5 and 6.

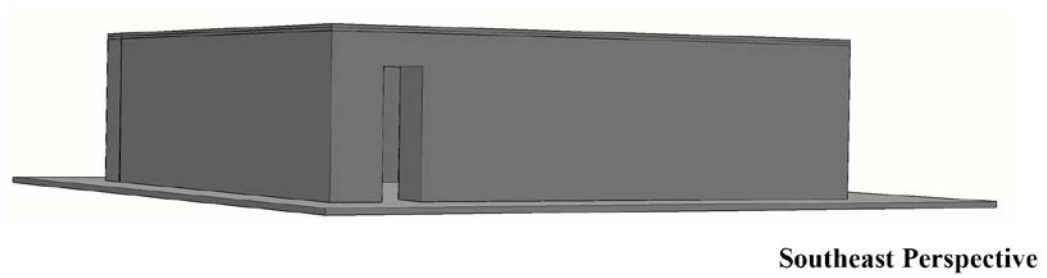
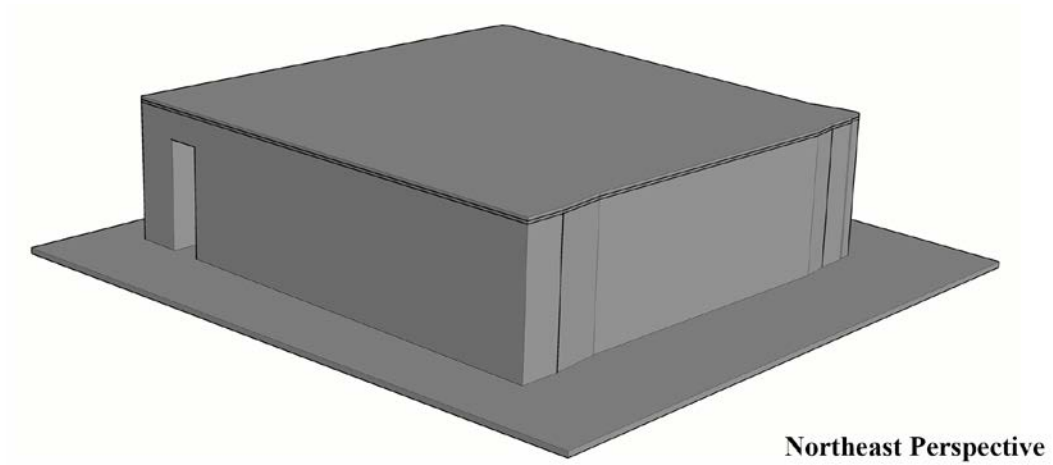
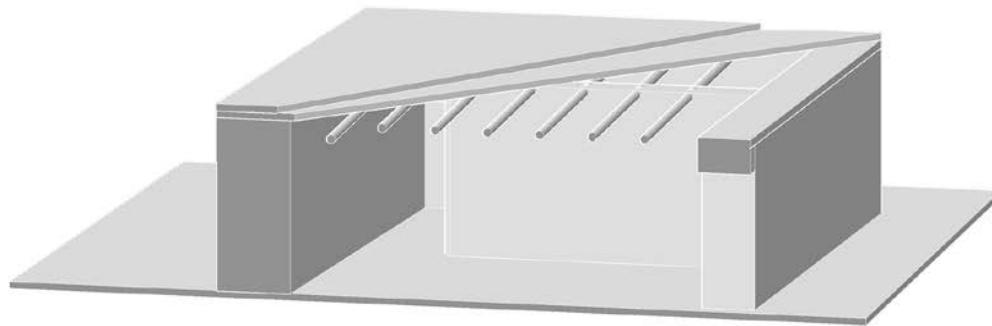
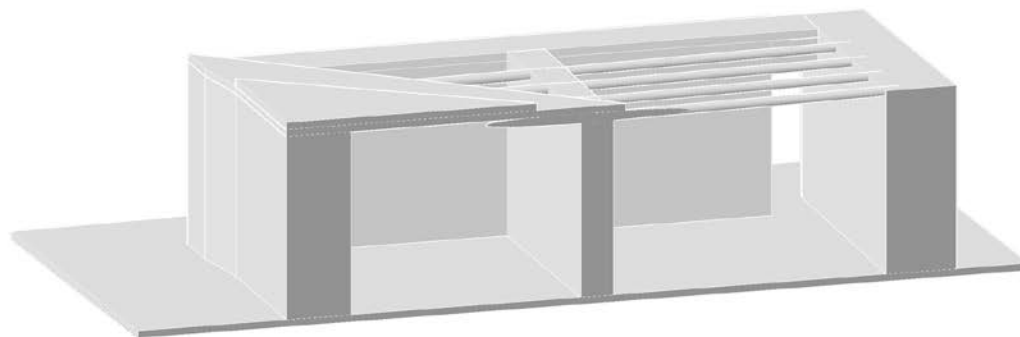


Figure 35. Field C Persian pillared building perspectives.



East-west Section



North-south Section

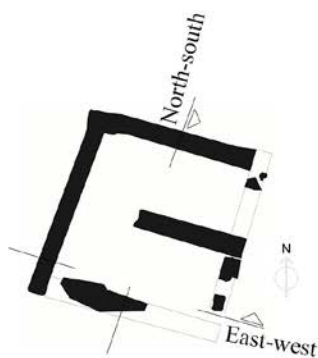
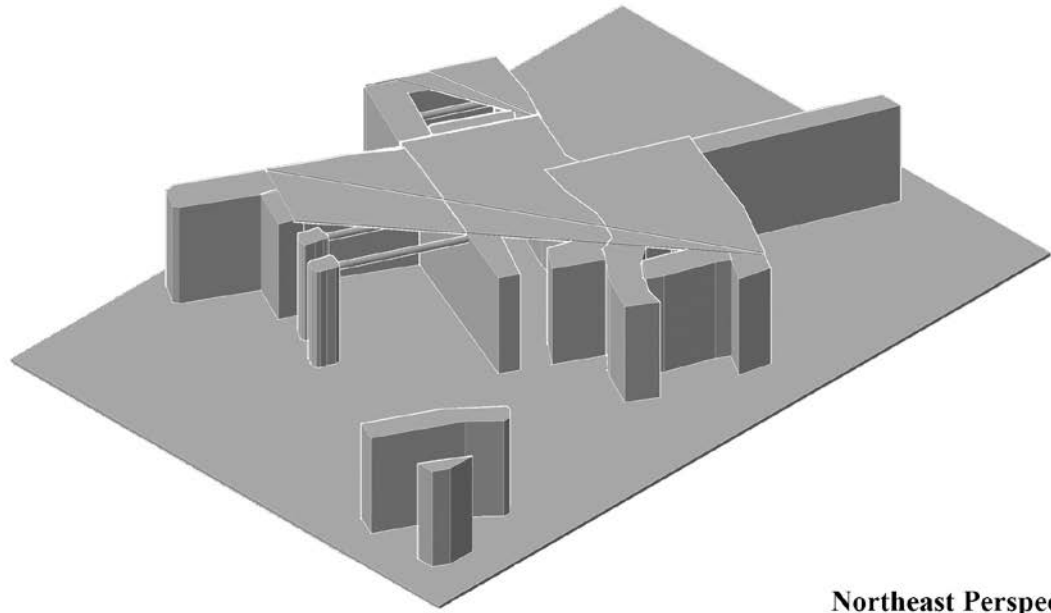
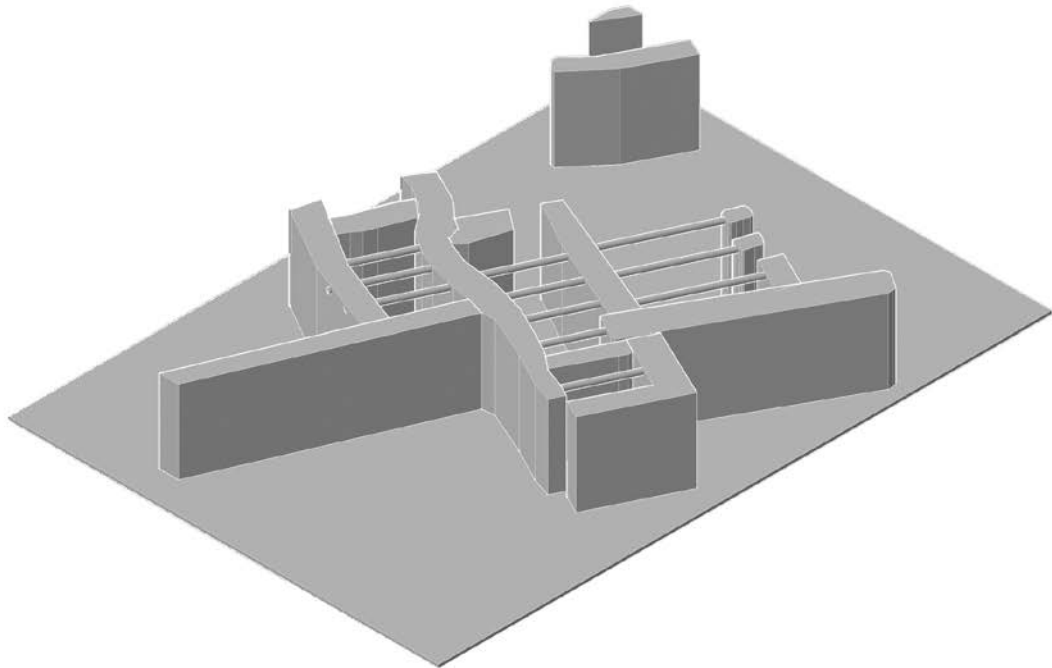


Figure 36. Field C Persian pillared building sections.



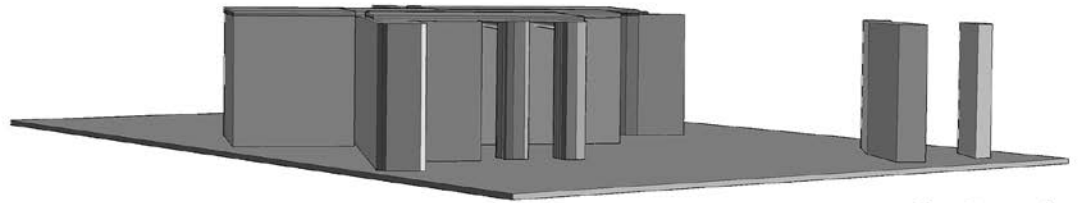
Northeast Perspective



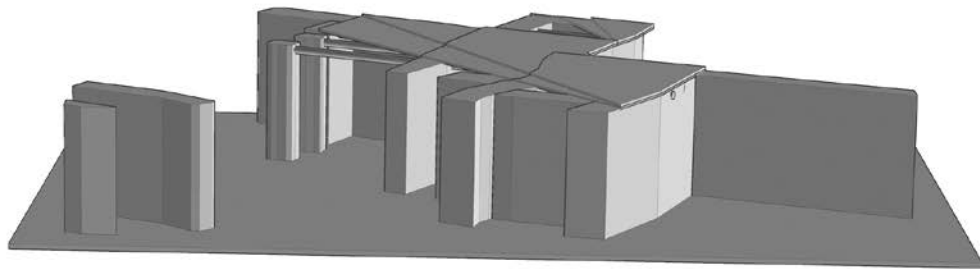
Southwest Perspective



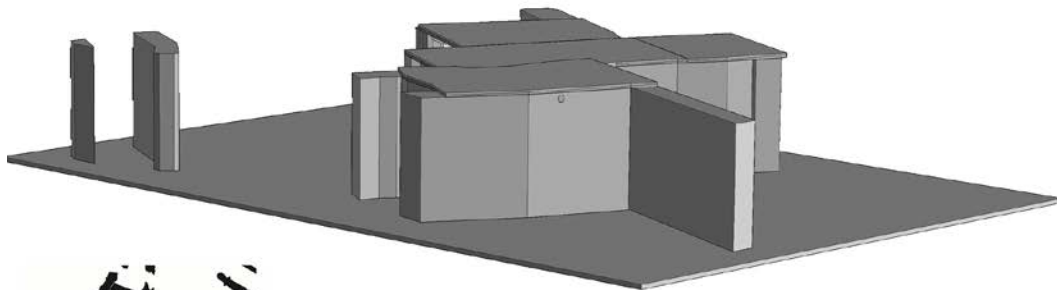
Figure 37. Field D Persian open-court house isometric perspectives.



East Perspective



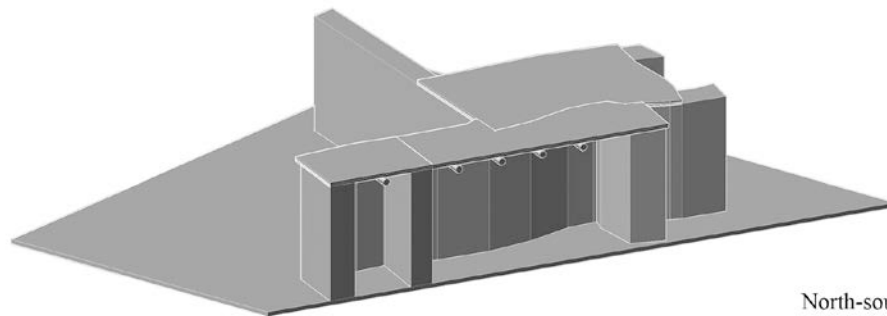
North Perspective



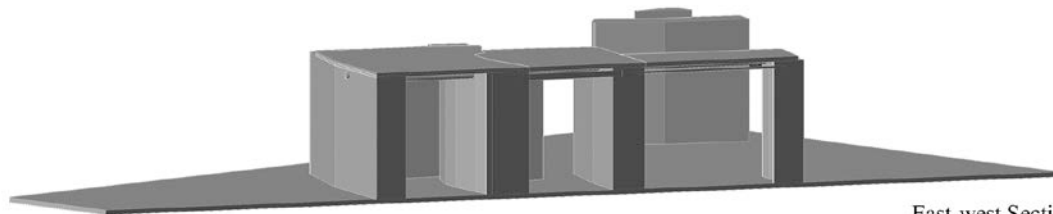
Northwest Perspective



Figure 38. Field D Persian open-court house perspectives.



North-south Section



East-west Section



Figure 39. Field D Persian open-court house sections.

CHAPTER 3

FIELDS G AND W

Water Systems

General Description of Water Systems

The water supply was a main concern for people in antiquity. Water sources conditioned the location of settlements since the beginning of urbanization in the third millennium B.C. It is evident that when water resources were well managed, agriculture was more productive, commerce and the economy in general gained strength, and the population increased (Shiloh 1992). On the other hand, when there was no water inside a city, a siege was highly dangerous. The dread of siege by expansionist empires was probably the reason behind the improvements in water management and engineering (Barkay 1992).

Fear was not the only factor that influenced water systems. Their presence and complexity were directly connected with the development of settlements during periods. When there was a drop in settlement and central authority, water systems and major building endeavors were not developed or maintained. But in the Iron Age, the Early Roman, and the Byzantine periods, settlements were booming, therefore, complex water systems improved (Shiloh 1992).

Water sources differed in royal cities and other settlements. Cities and small towns could have water from springs, wells, cisterns, and reservoirs. Springs were natural sources of water favored by the porous limestone in the Levant, and often determined the location of settlements. Wells were an artificial way to solve the problem of lack of water; their shafts were lined with fieldstones and their mouths were usually covered to prevent water contamination. Cisterns were artificial reservoirs that collected and conserved water from rain in bedrock-cut tanks; they had to be plastered to seal their surfaces and cleaned yearly to remove accumulated sediments (King and Stager 2001). Reservoirs are known to have existed in many places such as Jerusalem and Dibon (as mentioned by King Mesha in the inscription on the Moabite Stone). Reservoirs were used for a long period of time, from 4,000 B.C. until the Roman/Byzantine periods. They captured and stored rainwater for the year. Sometimes water channels were used to draw water to the reservoir.

When a reservoir was opened and exposed to the weather, it would get polluted rapidly and the temperature of the water would be higher than desired for human consumption. Thus, drinking water from a well was preferred for its freshness and quality. Reservoir water was used for cattle, agriculture, or anything that needed large quantities of water. Some scholars say that a reservoir was constructed as an additional water source when the well would not provide enough water for the city (Oleson 1992). Others say that pools were constructed adjacent to wells to facilitate the watering of animals (King and Stager 2001: 122-27).

Royal cities built more complex water systems. Their origin is unknown. It is possible to find evidence of the construction of reservoirs and pools within fortified

towns during the Bronze Age; however, they were on the surface, not underground like the ones found in the Iron Age. Some scholars state that evidence points to Mycenaean influence on the development of underground water systems in the 13th and early 12th centuries B.C. (Shiloh 1992). Definitely there are some similarities, but if this were the case, Mycenaean cultural material would be present in other specialties such as pottery and architecture as well.

According to Cole (1980), the Gibeonites were the first to build a water system. He says that Hazor's engineers already knew what needed to be done because it did not present signs of error and reconstruction; therefore, they followed a pattern previously established. On the contrary, Gibeon shows signs of errors and reconstruction. It is clear that the finding of the water table was accidental in Gibeon (Cole 1980).

Due to their complexity, water systems demanded sophisticated hydroengineering. Cities were usually built on top of hills for defensive purposes. However, the drawback of that was that access to water became more difficult. It was necessary to dig deeper shafts through the bedrock to reach the water level. The distance from the water table to the ground surface had to be known before construction of the system began, because it would determine how wide the shaft mouth should be to have steps in a spiral until it reached the water level.

Water systems can be classified in various ways. Barkay (1992) proposes the following division: those that bring the inhabitants to water and those that convey water to the inhabitants. Shiloh (1992) suggests a more complex classification within underground water systems: shafts and tunnels leading to a source outside the city; shafts and tunnels leading to the water table at the base of the mound; shafts and tunnels leading

from an external source to the base of a vertical shaft; tunnels and feed channels supplying large reservoirs; and external approaches to sources at the base of the mound. An additional classification is suggested by others (Kaplan 2010; King and Stager 2001): a northern group including Gibeon, Hazor, Gezer, and Megiddo, and a southern group including Tell Arad, Beth-Shemesh, Tel Sheva, and Kadesh Barnea.

The dating of water systems has been controversial. Even though it is quite safe to say that a shaft was dug after the latest stratum it cuts, this is not helpful for dating a later system where erosion damaged the highest strata (Cole 1980). As with other archaeological finds, we have to ponder a series of factors in order to date water systems correctly. Because water systems are made of depressions, gravity works to bring later and earlier artifacts inside of the depressions. Furthermore, some water systems were discovered in the early stages of the history of archaeology, and stratigraphic errors made it difficult to date them correctly. Thus, there is no agreement among scholars concerning the dates of the water systems. Even without a consensus and specific techniques to date the water systems, some of them found in the royal cities have a suggested date of the tenth century B.C.

Underground water systems are normally found in royal centers such as Hazor, Gezer, and Megiddo. The presence of a water system in a settlement implies urban planning. Usually, public buildings, city walls, and a city gate accompanied it. Building a water system demanded a large area, and it was expensive. Therefore, not every settlement had an elaborate water system. Even though water systems were not present in every city in the region, it can be said that underground water systems are a characteristic feature of Israelite city planning (Barkay 1992).

Comparison with Similar Structures

The water system in Jalul (fig. 40) has been only partly excavated so far. One of its components, the reservoir, has been excavated only for two seasons, 2011 and 2012. The other component, a water channel, has not been fully excavated either (figs. 42-43). Thus, it is difficult to determine parallels for Jalul. No underground water supply has yet been found in Jalul. The reservoir is on top of the bedrock and is not as deep as those in Israel. Nevertheless, its rim is very wide, indicating a possible massive size. It is interesting that not much pottery has so far been found at the lowest parts of the excavated section of the reservoir. One reason might be that the reservoir is deeper at the center, concentrating the pottery. It has to be considered also that the level of the water table has changed during the years due to the amount of rainfall and its use.

The reservoir at Jalul is bigger than the cistern found in Tall Jawa, Jordan. Also the cistern at Tall Jawa was well underground, whereas the reservoir in Jalul is exposed to the weather. Tall Jawa's cistern was roughly circular, varying in radius from 5.69–5.98 m (Daviau 2003), with an approximate perimeter of 36.42 m. Jalul's reservoir is only partly excavated, but 12 m of its perimeter has been unearthed, and the depression in which the reservoir was found presented a radius of 25 m before excavations started.

A late Iron I reservoir was found at Hesban. It is bigger than the one found at Tall Jawa. Its estimated dimensions are 17.5 m x 17.5 m x 7 m, with the capacity to hold 2,200 m³ of water. Jalul's reservoir's total size is still unknown, but it is probably closer in size to that of Hesban than to the Jawa cistern. Hesban's reservoir was plastered in the inside, like the one at Jalul. In addition to the reservoir, a plastered pool measuring 4 m x 5 m x 1.5 m, a cistern dating to the Iron II/Persian period, seven other cisterns from the

Roman period, and a large Byzantine reservoir were found. The Byzantine reservoir could hold up to 3,341 m³ and is located east of the tell (Merling 1994).

Another water work found in Jalul is the water channel. It is dated to the seventh century B.C. Its inclination and position show that it took water from the inside to the outside of the city. Furthermore, it passes the water reservoir by the east side and most likely does not connect to it. Looking at the date and shape, it is possible to suggest that it is from the Assyrian period. Drainage systems are one characteristic of that period (Amiran and Dunayevsky 1958). Nonetheless, the typical Assyrian drainage system was made with pipes of terra-cotta (Reich 1992), and at Jalul it is made with limestone and plaster.

There may be a water channel at Hesban as well. It is wider and deeper, but the excavated section is not as long as the one in Jalul. Hesban's is dated to the Iron Age I, while Jalul's water channel is dated to the Persian period. The function of Hesban's water channel is not clear, since no cistern was found connected to it (Merling 1994).

History of Excavations

The water system in Jalul was first dug in 2007, when a water channel was accidentally found crossing Field G and cutting the city wall in Square 4. During this season the nature and purpose of the channel were not clear; nonetheless, it was clear that the city wall and the channel did not belong to the same time period. The channel is 0.8 m wide, and its side walls are up to 1 m high. The channel is constructed with flagstones and plastered on the inside.

The 2009 season uncovered a building in Field G, a further extension of the water channel and parts of the city wall (Younker et al. 2009). In 2010, one of the main goals of

the season was to follow the water channel and its route. Thus, a new field was opened, Field W, with four squares. The season revealed the continuation of the water channel. It did not follow the expected straight line from the city wall to the reservoir, but curved and passed the depression on its eastern ridge (Gregor et al. 2011). By the end of the season it was concluded that the channel did not serve to supply water to the city, but rather to lead water out.

In 2011 two new squares were opened, W5 and W6, with the goals of discovering the possible continuation of the water channel and the existence or not of a water system in the depression in Square W6. A small continuation of the channel was found in the northeast corner of Square W6. The southern part of a water reservoir was also found in Square W5. The bottom of a sloping section of the reservoir was reached after 4 m of excavation. The reservoir's wall at this point was 2 m high and 1 m thick. The inside wall was covered with plaster. A probe dug at the bottom of the reservoir showed that the plaster was 35 cm thick. It had been replastered at least four times. It was not possible to date the plaster layers, since they did not contain any datable material. The pottery found on the lowest part of the reservoir excavated so far dated to the Late Iron Age II.

In 2012 five additional squares were laid, W7-11, around the previously excavated squares. The goals of this season were, if possible, to discover the date of the construction of the reservoir and to unearth more of its structure. Structures close to the reservoir's wall helped the dating process. Some of these structures include floors unearthed in Square W2. The continuation of the reservoir's wall was found in Squares W7 and W11. An access floor to the reservoir was found in Squares W2 and W11, surrounding the reservoir's access on the southeast. The floor was made of beaten earth

and surfaced with pebbles, creating a non-slippery surface. A wall was also found inside the reservoir, partitioning it in the south in Square 7. This wall was not plastered on its south face, and the north face could not be excavated, as it was in the balk. Therefore, it is not yet possible to know the function of the wall, and further excavations are needed to establish its purpose. The reservoir's construction could be dated to the occupational Phase II, the ninth century B.C. (Gregor, Younker, and Ray 2012). A fractional continuation of the water channel was found in Square W11, adding up to a total of 50 m to date. So far, it does not connect with the reservoir, but passes on its eastern edge (fig. 41).

Figure 42 portrays two isometric views and a side view to show the inclination of the water channel. Figure 43 is made of perspectives closer to the view of the pedestrian inside the city. Figures 44-48 show the different phases of occupation of the building found in building G.

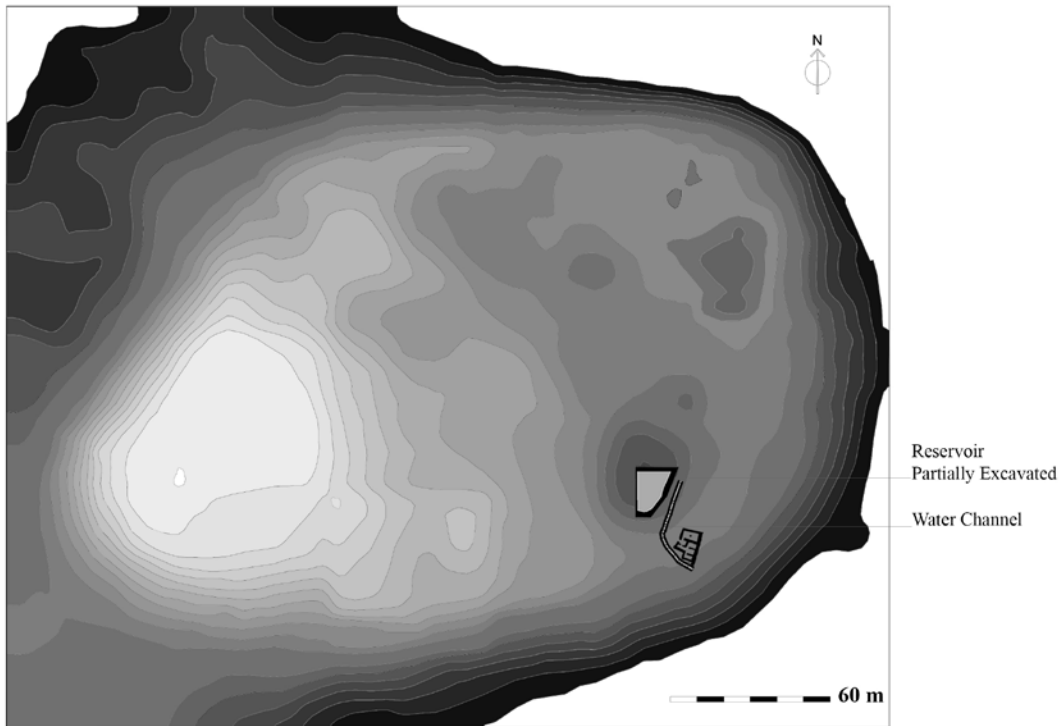


Figure 40. Fields G and W water system topographic map.

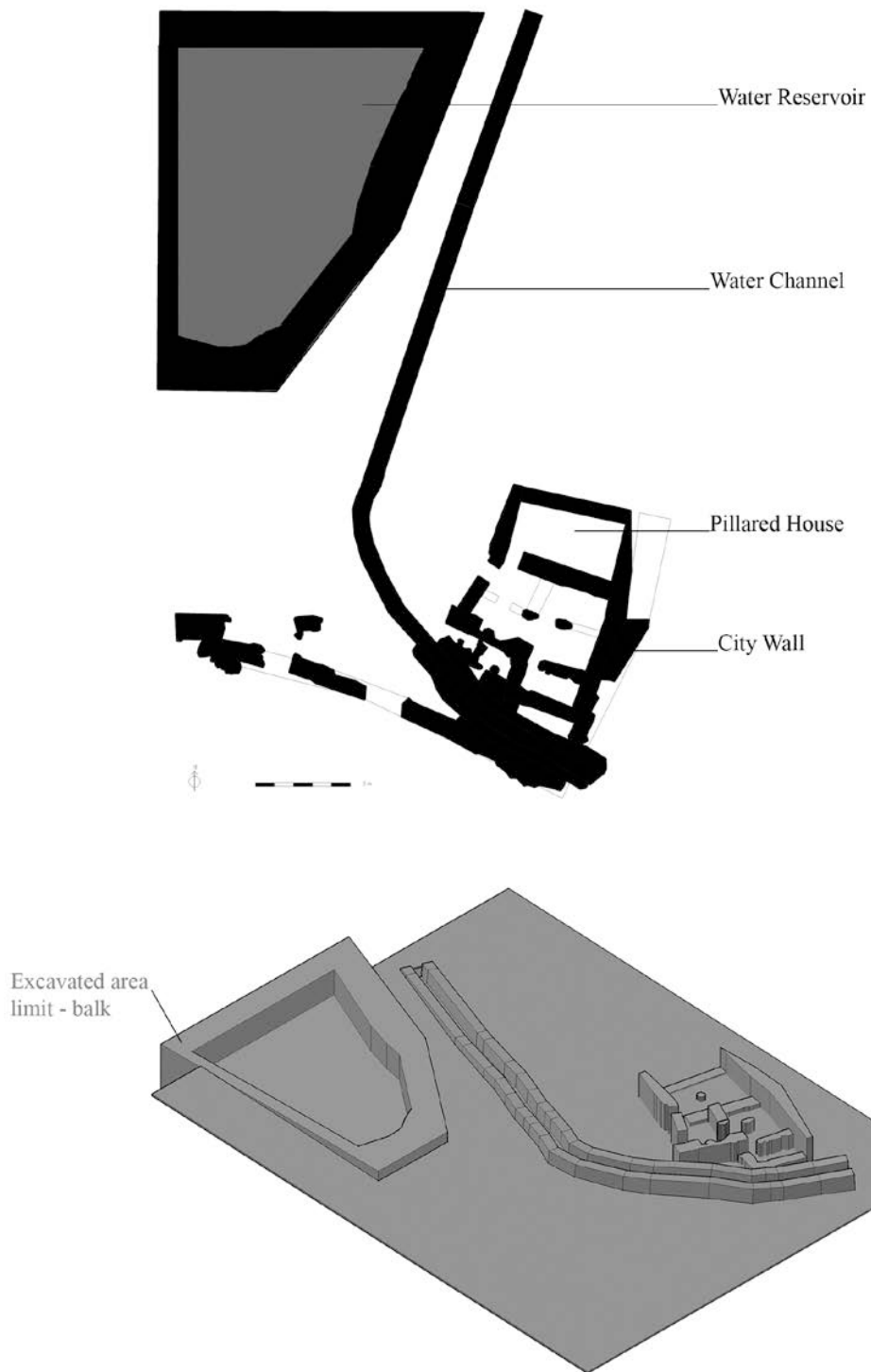


Figure 41. Fields G and W water system top plan and ruins isometric perspective.

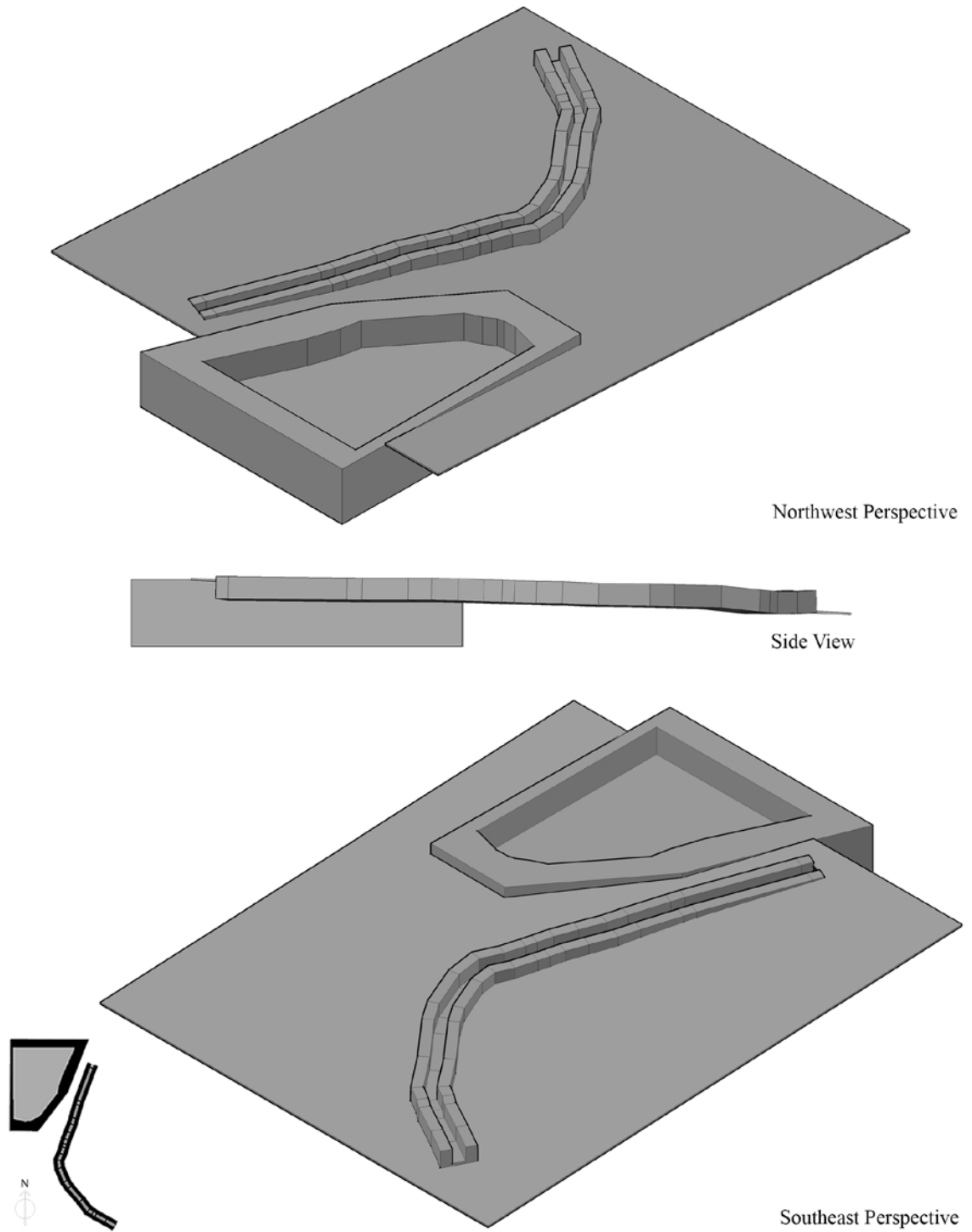
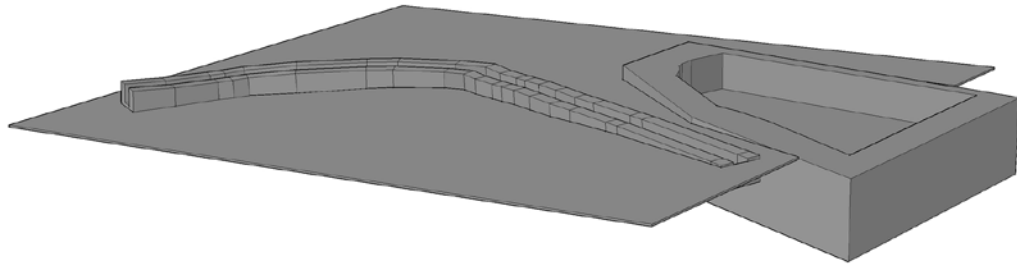
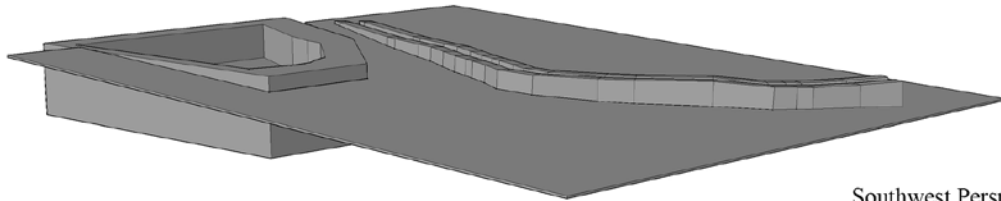


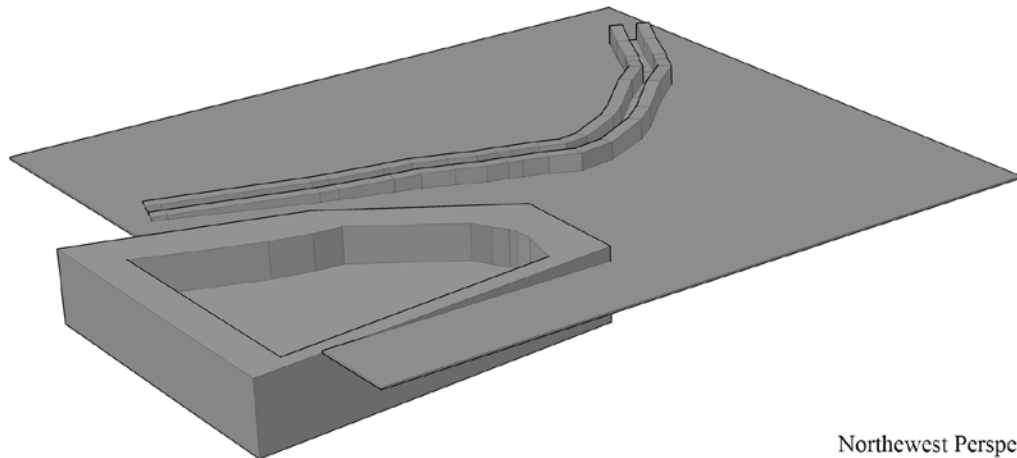
Figure 42. Fields G and W water system isometric perspectives.



Northeast Perspective



Southwest Perspective



Northwest Perspective

Figure 43. Fields G and W water system perspectives.

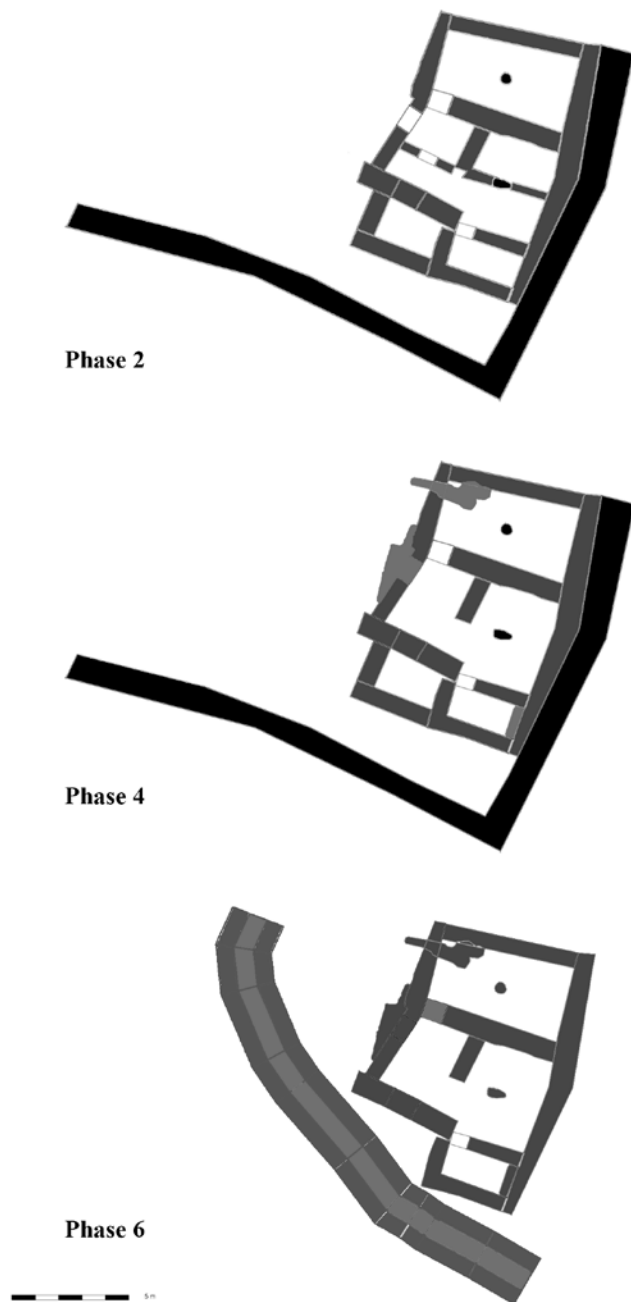
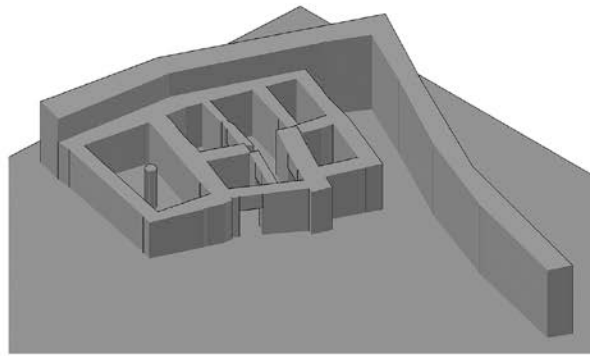
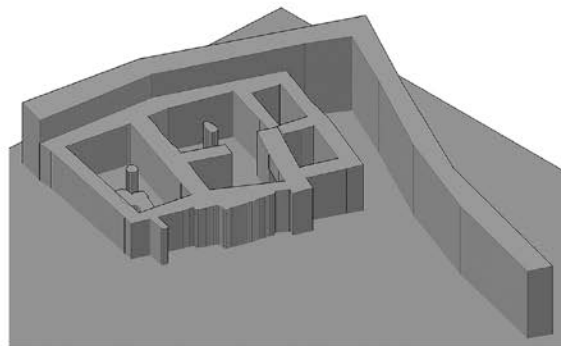


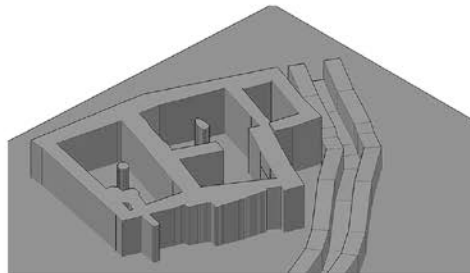
Figure 44. Field G pillared house Phases 2, 4, and 6—reconstruction top plan.



Phase 2



Phase 4



Phase 6

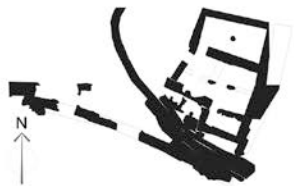


Figure 45. Fields G Northwest isometric perspectives Phases 2, 4, and 6.

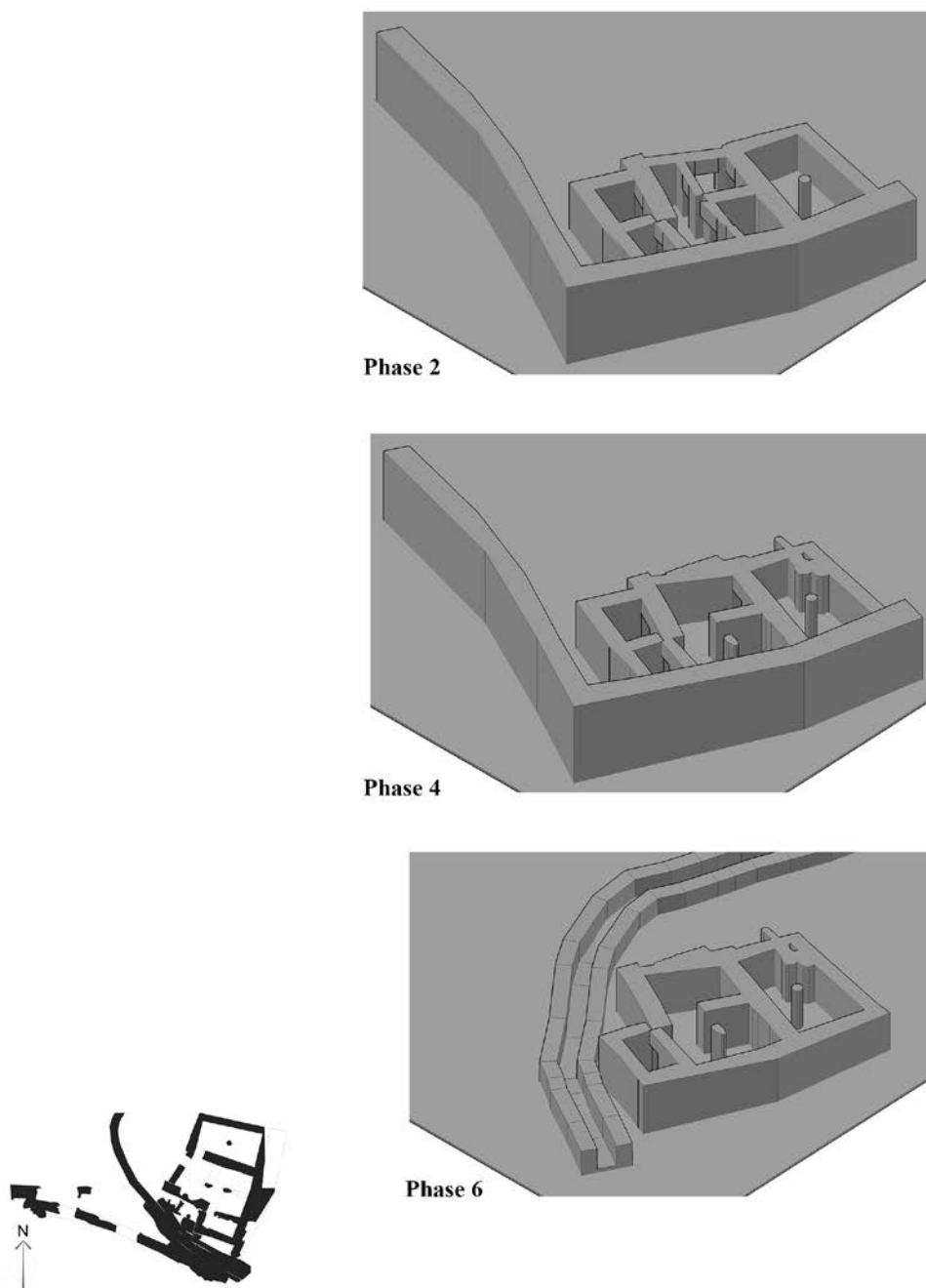
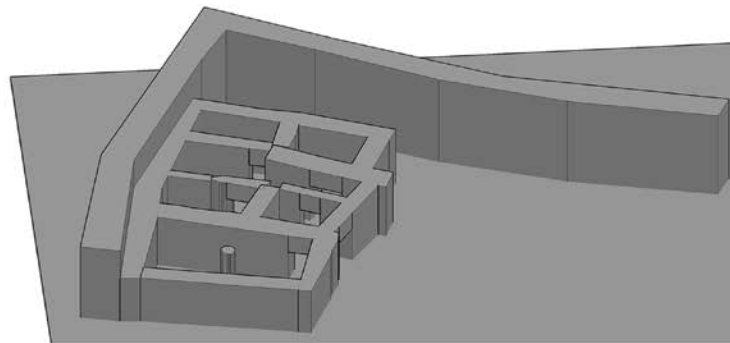
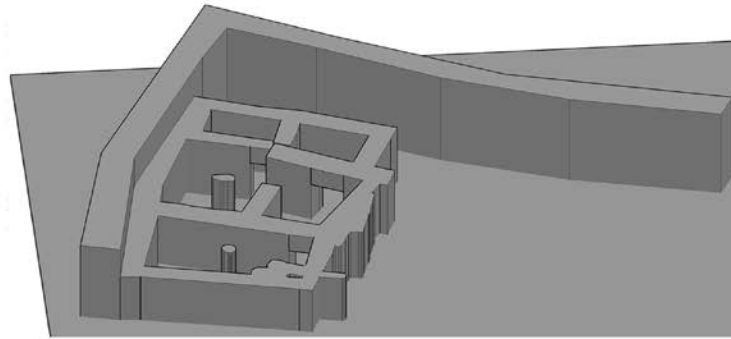


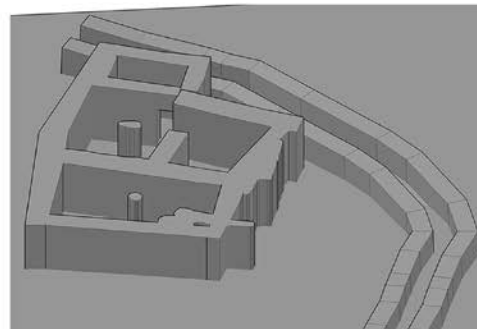
Figure 46. Fields G Southeast isometric perspectives Phases 2, 4, and 6.



Phase 2



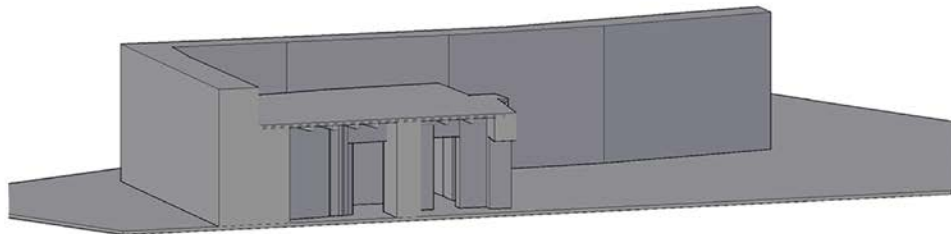
Phase 4



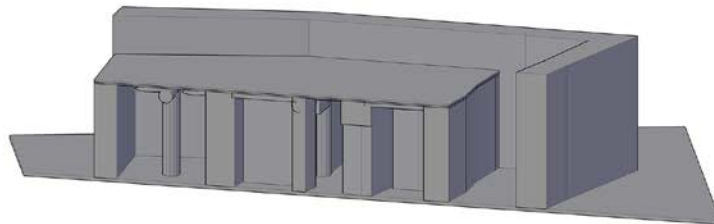
Phase 6



Figure 47. Fields G perspectives Phases 2, 4, and 6.



Section East-West



Section North-South

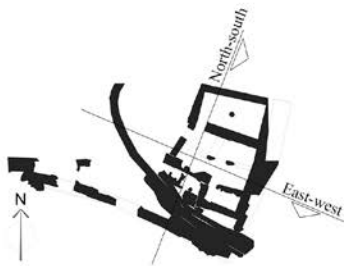


Figure 48. Fields G East-West and North-South sections.

CONCLUSION

In studying the architecture features at Jalul and comparing them with those at other sites in the surrounding region, it is possible to establish similarities and differences between Jalul and other sites from the Iron Age I to the Persian period. Each structure was first analyzed separately, and below are the outcomes.

The pillared tripartite building found in Field A fits well with the descriptions proposed by scholars for this kind of structure. The major differences between Jalul's pillared building and other pillared buildings are related to urban planning. Jalul's building is far from the city gatehouse, 75 m away, while most of the pillared buildings at other sites were located closer to the gate complex. In addition, to date only a single unit was found in Jalul, whereas at other sites complexes of many units were found.

The gatehouse suffered great denudation through the centuries; only a few stones were left to testify to its existence. Therefore, it was not possible to determine the shape and size of the building. Nevertheless, in the approach road more stones were left in place than at the gatehouse, allowing comparisons to be made. The approach road was built in a similar fashion to those at Tel Dan and Tel Beersheba. At both sites the approach road led to a four-chambered gatehouse dated to the same period as Jalul's road, the tenth century B.C. (Randall Younker, personal communication). Shechem, a refuge city, also possessed a four-chambered gate, but it is dated to the Middle Bronze Age. If Jalul was Bezer, a

refuge city in biblical times, a good reconstruction for Jalul's gate would be the four-chambered one.

The four-room house found in Field C in Jalul was quite a large structure for a gated city. It was larger than usual, indicating the wealth and importance of its owners. It was located in a prominent place, probably by the road that connects the city gate to the acropolis. In addition, it had an extra space, a cave whose access was in the middle of the original plan of the house. Later, the house was remodeled into a three-room house. During the same period the approach road was rebuilt and the city wall in Field G was built.

The Persian-period open-court building found in Jalul in Field D does not follow all the characteristics described by Amiran, Dunayeski, and Reich, but it has a courtyard surrounded by rooms and it is dated to the Persian period. The contour of the building has not yet been fully unearthed, but it is possible to say, based on the findings, that it is an open-court building. This kind of building demanded a great effort to build due to its size and sophistication, and they have not been found at many sites. Therefore, it could be concluded that the simple presence of this building is an indication of the importance of the site in that period.

Jalul's water system is unusual. It is not as small as the one found in Jawa, but based on the evidences found so far, it is not as developed as the ones found in Megiddo and Hazor. So far, no underground facility has been unearthed. Considering that the city clearly shows concerns with security—demonstrated by the construction of two gates and a city wall—it is odd for this kind of settlement to have such simple water works because a siege would be much more dangerous than a frontal assault. Thus, looking at the size of

the buildings so far revealed in Jalul, one would expect to find more water-related constructions in further excavations, or to learn that the partly excavated reservoir leads to a more elaborate water system.

Table 1 shows the occupational phases of each structure studied.

Table 1. Occupational Phases of Each Structure

	Occupational Phases				
Jalul's Buildings	Iron I	Early Iron II	Mid/Late Iron II	Late Iron II	Late Iron II /Persian
Tripartite Pillared Building				X	
Approach Road and Gatehouse	X	X	X	X	X
Four-Room House	X	X	X		
Open-Court House					X
Water Channel				X	X
Water Reservoir		X	X	X	X

The royal cities showed an organized urban plan with city walls, city gates, public buildings, and water systems (Herr 1988). The existence of these structures with their generous proportions testifies to centralized power and social stratification. Jalul displays all of these structures on the tell, but the proportions are smaller than those of the royal cities.

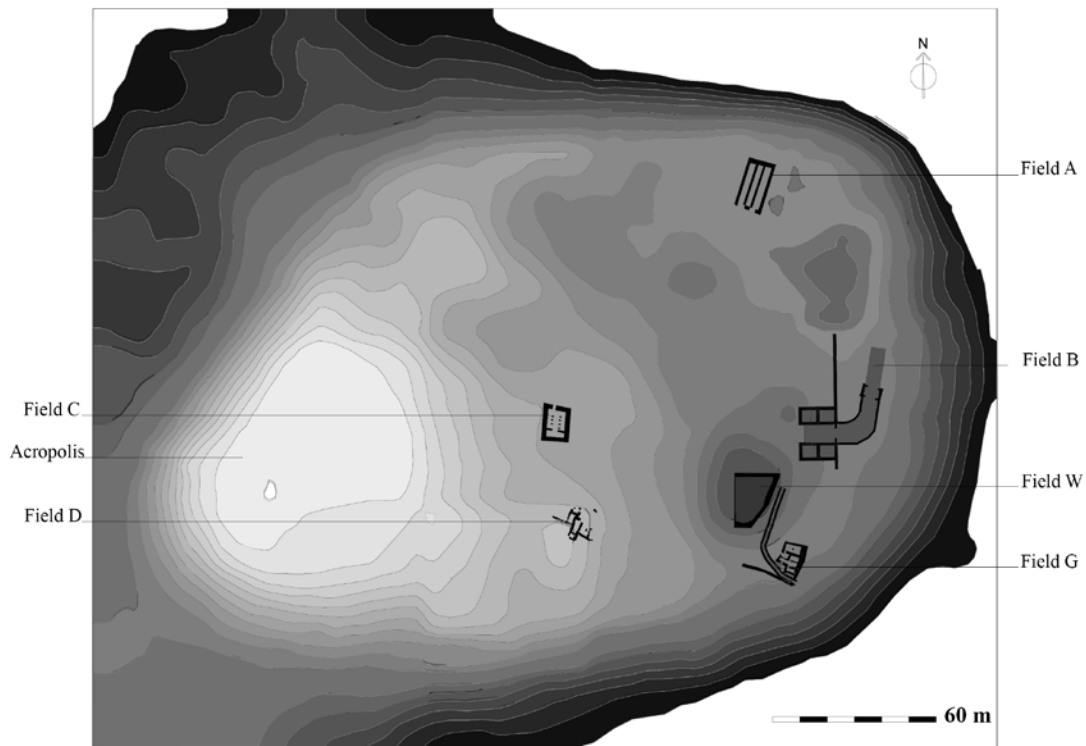


Figure 49. Jalul's topographic map.

However, Jalul is not small enough to fit the description of a village. Villages would fit within an area of one hectare (Faust 2012: 130). Jalul's area is 18 acres. In addition, residential units of 120 to 130 m² would be considered large in a village (Faust 2012: 130), but the residential unit found in Jalul covers 130 m² for only the first floor. Moreover, Jalul presents a substantial variety of buildings that are not seen in villages (Holladay 1992).

In researching the architecture of Jalul, it is possible to see that Jalul was an important site in different periods. It was not a royal city, but it shows signs of a centralized power that ordered the construction of large endeavors. Jalul was probably an

administrative center or some kind of settlement that was between a royal city and a village. The sizes and kinds of the buildings point to that.

However, after centuries of occupation, the tell was left to denudation. From what was left after robbery, a minor area has been unearthed, and the most promising area, the acropolis, cannot be dug. Therefore, future excavations are necessary to establish a solid conclusion about Jalul.

The second half of this project was the production of electronic three-dimensional models of the above-discussed structures. The models were made using two-dimensional top plans of the field previously prepared in Adobe Photoshop. At first, in order to give a more realistic view of each structure, I intended to draw each stone individually.

However, it was not possible to do that due to the size of the file that it generated, so the models were made wall by wall instead of stone by stone. The shape of the ruins found at the time of excavation and the thickness of the walls were respected, and the above research clarified the reconstruction process. Once each structure was finished, it was located on the topographical model of the tell.

This is not the end of the study of the architecture of Jalul. Every new season will shed more light upon the subject. Technology will also improve, changing the way we see things now. Thus, we may expect that future excavations will reveal a clearer picture of Jalul's history and identity.

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